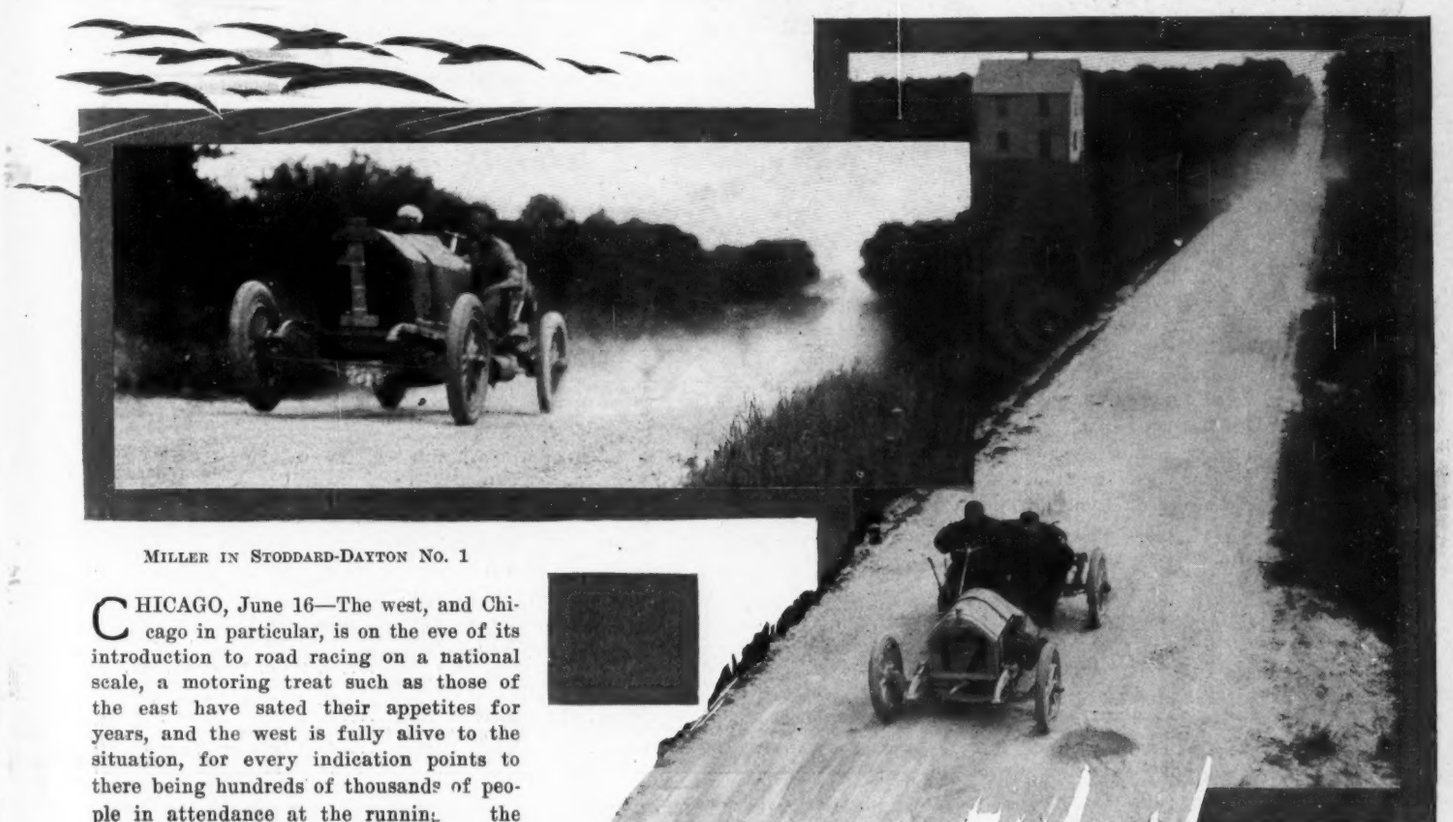
VOL. XV, No. 24 CHICAGO, JUNE 17, 1909 $3.00 PER YEAR

MOTOR AGE

WEST IS READY FOR ITS FIRST ROAD RACES



MILLER IN STODDARD-DAYTON NO. 1

CHICAGO, June 16—The west, and Chicago in particular, is on the eve of its introduction to road racing on a national scale, a motoring treat such as those of the east have sated their appetites for years, and the west is fully alive to the situation, for every indication points to there being hundreds of thousands of people in attendance at the running of the Cobe cup and Indiana trophy races over the Crown Point-Lowell circuit Friday and Saturday of this week under the auspices of the Chicago Automobile Club.

The fields have been made up, the course has been put in shape, the technical committee has examined all the cars and found them up to stock specifications, the daily papers have realized the magnitude of the affair, and if the road carnival is not the success it is anticipated it will be the fault of the people themselves, who, perchance, may not have been educated up to that point where they are willing to go 50 miles to see the great speed battles.

At the present writing it looks as if all the cars entered will go to the tape. The only one not accounted for to date is the little Ford, which had not appeared at the course up to this morning, but which is expected in some time during the day. Practice has been going on officially since Monday, but for several days before that the drivers took advantage of the friendliness of the Lake county people and worked out in the early morning hours without flagmen on the course. However, on Monday General Executive Trego had some of his flagmen in readiness and he permitted official practice to begin. The first afternoon few cars were out and nothing sensational in the way of time was recorded. The only ones to go complete laps were the three Chalmers-Detroits, which ran consistently, each making the circuit of 23 1-3 miles in a shade worse than 27 minutes.

CHALMERS AT THE GRAND STAND

The practice yesterday afternoon was more prolific of excitement, for the Appersons joined the colony, and both Lytle and Seymour hit the pike for fair. It remained for Strang in the Buick, however, to carry off the speed honors of the afternoon, when he whizzed around in 24 minutes, which is 57 miles an hour. This is not believed to be the limit of the course's speed. Indeed, some of the rail birds had Strang doing 21 minutes, but no one in the timers' stand caught it at that.

Earlier in the week there was consid-

DRAWING FOR NUMBERS

BRIDGE OVER COURSE AT LOWELL

erable criticism of the course, but it develops that the critics were talking before the circuit had been completed. It was stated that the course was rough in spots and that some of the approaches to the bridges were in poor shape; but the last day or so many of these alleged defects have been remedied. The loose stones on the course will be swept off tomorrow, and then it is expected there will be a noticeable increase in speed. The course has a taroid surface and because of the recent rainy spell it has been impossible to get it in shape, for it requires sun to bring the tar to the surface and bind the stones. The weather at the present time, however, is warm and it is stated that by Friday there will be no chance for complaining of the course. Some of the easterners who got here today declared they had been told the roads were heavily crowned; such is not the fact, however, the highways being remarkably flat.

As to the passing of cars during the race, there are of course places where such is impossible, just as there are in every other course, but the fact that Denison has gone by another car at 90 miles an hour ought to settle this dispute.

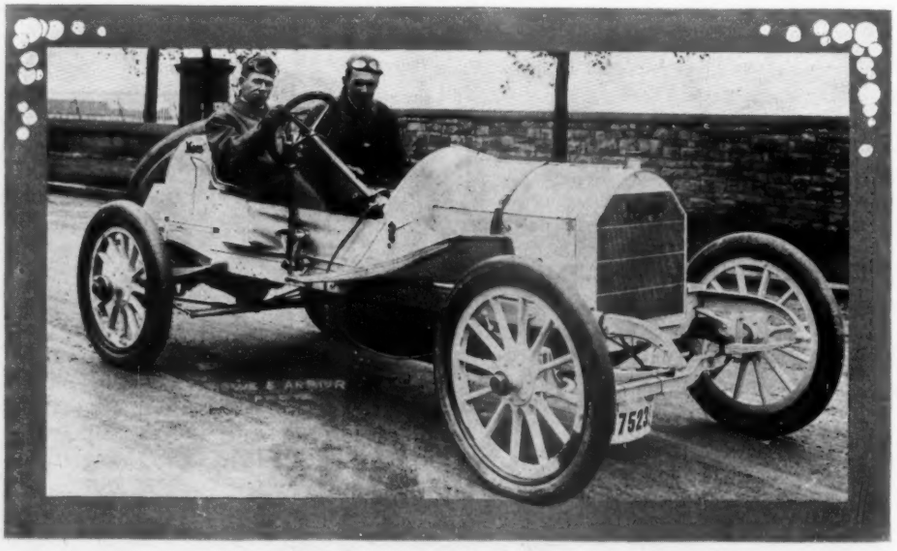
So far there has not been an accident to mar the affair. Glen Ethridge, mechanic for Robertson, was hit in the face by a stone, but this hardly can be called an accident. Young Hearne, entrant and driver of the Fiat, broke a connecting rod Saturday, but he was out on the course again yesterday afternoon, having been supplied with the extra part without hardly any delay.

Every precaution thought of that will insure the safety of the public has been taken. More than 6 miles of wire fencing has been put up at places where there is likely to be congestion, and bridges crossing the course have been built. There is one at Crown Point over which the cars and pedestrians desiring to get inside the course will pass. Another is located at Lowell, at the far corner of the course, while there are two bridges at the grand stand, one at each end, which will permit the people to pass from one side of the road to the other without danger of being hit by the cars.

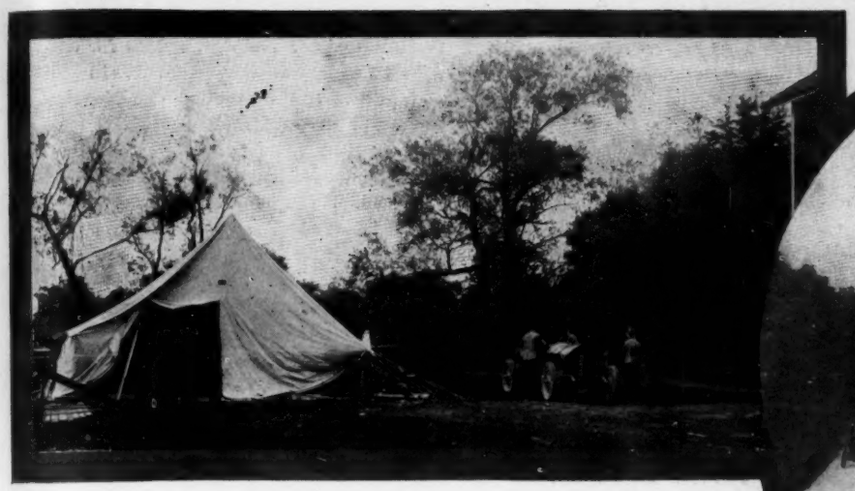
The First Regiment of the Illinois National Guard will go on the job Thursday

CARS, DRIVERS AND MECHANICS IN INDIANA TROPHY RACE

No. Car—	A.L.A.M., H.P.	Tires	Driver and Residence	Mechanic-Residence
1—Corbin	32.4	Diamond..	A. Maisonville, New Britain, Conn.	J. Aude, New Britain, Conn.
2—Buick	30.4	Michelin..	R. Burman, Flint, Mich..	J. Grinnon, New York
3—Marion	28.9	.....	C. E. Stutz, Indianapolis.	R.Tinkler,Indianapolis
4—Ford	22.5	Firestone.	G. Durrell, Detroit, Mich.	
5—Chalmers-Detroit	25.6	Michelin..	W. Knipper, R'hester,N.Y.	A. G. Richards, Columbia, S. C.
6—Marion	28.9	.....	A. Monsen, Chicago.....	J. Robinson, Chicago
7—Locomobile	32.4	Michelin..	J. W. Florida, P'delphia.	R. Campbell, P'delphia
8—Buick	30.4	Michelin..	G. DeWitt, B'm'gham,Ala.	G. Poirier, Jackson, Mich.
9—Fal-Car	28.9	Diamond..	W. H. Pearce, Chicago..	R. Stanfer, Chicago
10—Locomobile	32.4	Michelin..	G. Robertson, New York.	G. Ethridge, New York
11—Moon	32.4	Diamond..	Phil Wells, St. Louis....	Phil Goetz, St. Louis
12—Renault	24.3	Michelin..	A. W. Greiner, Chicago..	
14—Buick	30.4	Michelin..	L. Strang, New York....	P. Hart, Daytona, Fla.
15—Fal-Car	28.9	Diamond..	John Ruehl, Chicago.....	R. Kutz, Carlisle, Pa.
16—Stoddard-Dayton	24	Michelin..	F. Wiseman, S. Francisco.	G. Martin, Chicago
17—Chalmers-Detroit	25.6	Michelin..	Al Poole, New York.....	R. Gereau, Detroit
18—Stoddard-Dayton	24	Michelin..	C. Wright, Dayton, O....	W. M. Bell, Dayton, O.
19—Chalmers-Detroit	25.6	Michelin..	Joe Watson, Boston.....	Carl Schnor, Toledo



PHIL WELLS IN MOON, INDIANA TROPHY CANDIDATE



STODDARD-DAYTON CAMP AT CEDAR LAKE

VIEW IN FRONT OF GRAND STAND

night when 800 soldiers will leave Chicago on a special train. At Crown Point they will pitch their camp and for the next 2 days the Hoosiers will get a touch of military life in addition to seeing some high-class road racing. Colonel Sanborn, who is in charge of the regiment, has divided his men into three zones.

Something unique in the promotion of road racing is the camp for the officials. The hotel accommodations out Crown Point way are none of the best, so the officials concluded they would like to rough it a bit. Three big tents were secured and erected across the road from the grand stand, and there the officials are living, enjoying camp life to the full and getting their three square meals each day.

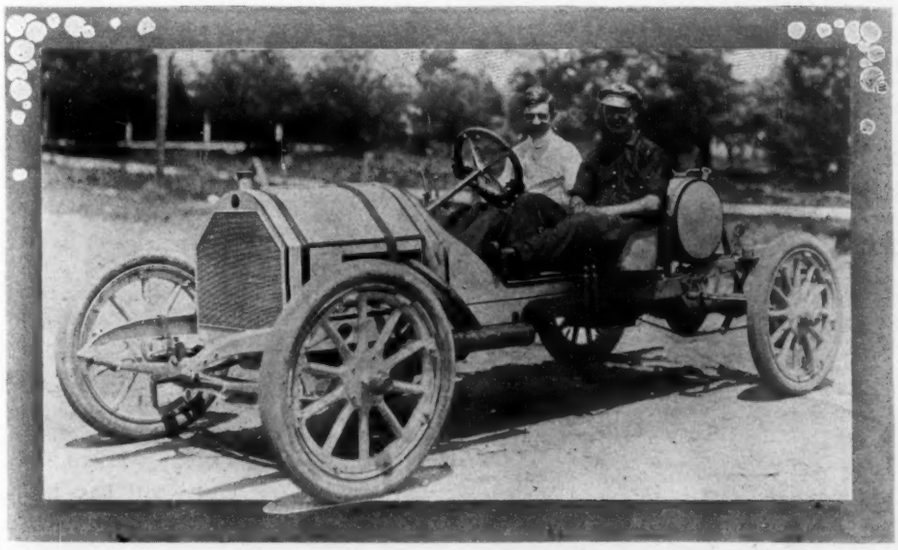
Drawings for positions in the two races were held last Friday noon, when General Executive Trego called the drivers into a session which was held in front of the press stand opposite the grand stand on the course. It was what might be termed the inauguration of the meet, the first official action following all the preliminary work leading up to the big event. That these drawings are of importance was shown by the fact that every driver who had joined the colony up to that time was present, ready to draw for himself and to fight for every little advantage.

It had been proposed that the drawing should be by entrants rather than individuals, which meant that a concern with three cars should draw three numbers at one time and the three cars be spread automatically down the list and thus separated. But Robertson and Strang objected. They pointed out that Savannah was the only one that had done it that way; that the Vanderbilt left it to individual drawing and that they preferred the Vanderbilt method. Willing to oblige, General Executive Trego left it to a vote and the vote favored Robertson and Strang. It was decided that the order of drawing should be by order of entering, which gave the Moon first draw in the Indiana trophy and the Buick first in the Cobe cup.

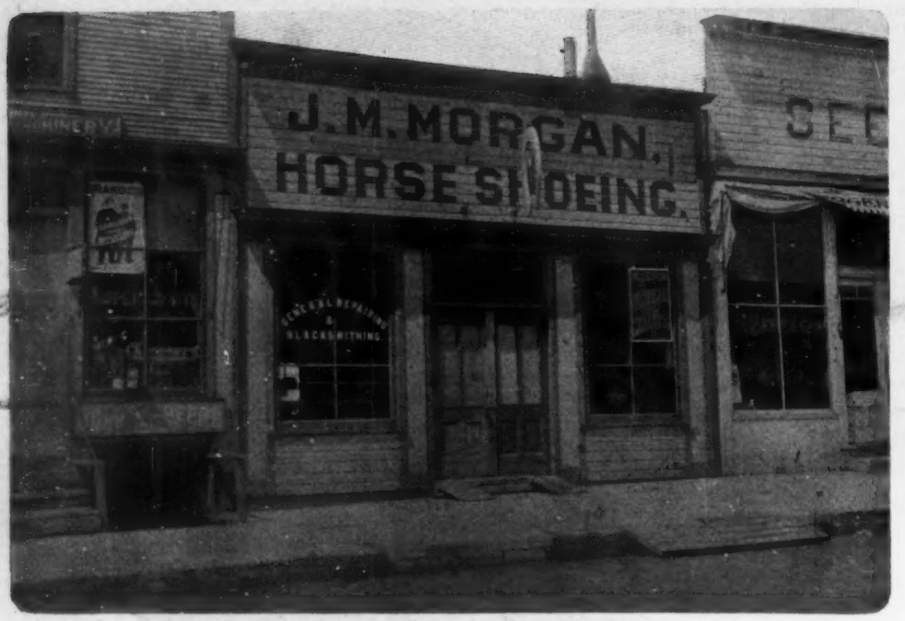
The little race was first taken up and A. M. Robbins drew for the Moon, getting No. 11. Then came the Buicks and Strang dipped for No. 8, while Pickens pulled out 8 for DeWitt and 2 for Burman. Fred Wiseman, the Californian who is to drive one of the little Stoddards, got 16 and his partner, Carl Wright, 17. As it was understood that in case two cars of the same make came together this way that they would be split by dropping one a notch lower, Wright had to take 18. The Marion pair, Stutz and Monsen, next came to the hat and Stutz was lucky enough to get 3

CARS, DRIVERS AND MECHANICS IN COBE CUP RACE

No.	Car—	A.L.A.M., H.P.	Tires	Driver and Residence	Mechanic-Residence
1	Stoddard-Dayton	44.1	Michelin	Bert Miller, Dayton, O.	J. Harcombe, Dayton, O.
2	Knox	40	Fisk	W. J. Seymour, S'field, Mass.	H. Holcomb, Springfield, Mass.
3	Apperson	53	Diamond	M. J. Seymour, New York	H. Hanschue, L. Angeles
4	Buick	32.4	Michelin	L. Strang, New York	F. Kuntz, Chicago
5	Stoddard-Dayton	44.1	Michelin	C. A. Englebeck, Chicago.	H. Tarkington, Chicago
6	Locomobile	40	Michelin	J. W. Florida, P'delphia	R. Campbell, P'delphia
7	Knox	48-4	Fisk	A. Denison, S'field, Mass.	F. W. Belcher, Springfield, Mass.
8	Apperson	53	Michelin	H. Lytle, Toledo	J. Bates, Toledo
9	Locomobile	40	Michelin	G. Robertson, New York.	G. Etheridge, N. Y.
10	Buick	32.4	Michelin	L. Chevrolet, New York	J. Nelson, New York
11	Fiat	42	Michelin	E. A. Hearne, Chicago	Jack Tower, Chicago
12	Buick	32.4	Michelin	R. Burman, Flint, Mich.	J. Grinnon, New York



KNIPPER IN ONE OF THE CHALMERS-DETROITS



WHERE THE KNOX IS QUARTERED IN CROWN POINT

RUEHL IN FAL-CAR

PEARCE IN FAL-CAR

CHALMERS-DETROIT HEADQUARTERS AT LOWELL

and Monsen 6. The Chalmers trio pulled out 18 for Poole, 5 for Knipper and 19 for Matson, but Poole was moved to 17 in place of Wright. Greiner pulled out No. 12 and then No. 1, which had been hiding somewhere in the bottom of the box, bobbed up, Maisonville, of the Corbin, getting it. No. 4 fell to the lot of the Ford, Robertson, of the Locomobile, picked 10 and his partner, Florida, 7. The Falcars were the last to draw, Pearce getting 9. This left only 15 in the box and Ruehl, of course, got that.

Miller No. 1 in the Cobe

Strang had twelve bits of paper from which to choose in the Cobe cup drawing, but the best he could get was No. 4. Pickens pulled 10 for Chevrolet and 12 for Burman. Then Miller, of the Stoddard-Dayton, invoked the aid of the goddess of luck and went after No. 1 and got it. Englebeck, his mate, also played in good luck by getting No. 5. No. 7 for Denison and 2 for Bourque were picked by the Knox representative, while Hearne, of the Fiat, landed 12. He was saved from last place, though, by Chevrolet and Burman being together, Burman having to drop back to No. 12. The Appersons will start third and eighth, Seymour getting third and Lytle eighth. Robertson landed 9 and Florida 6.

General Executive Trego moved his headquarters to Crown Point Friday, the sheriff having given up his office in the county building to the road race official. Trego took possession and at once started to tackle the mass of details that confronted him. He heard the report of the surveyor who chained the course for the purpose of knowing exactly the distance around the circuit. It had been odometered at 23.6 and that distance had been used in talking of the race. But the steel tape told another story and reduced the distance materially. It showed the course to be exactly 23.27424 miles around, which, therefore, will make the little race 232.74 miles in length instead of 236 and reduces the Cobe cup from 402 to 395.66.

Plans for the ambulance service have been completed, two ambulances having been proferred for the work. One of them is a White steamer ambulance belonging to F. F. Roberts, a north side undertaker, who has agreed to equip it with a doctor and nurse. This will be stationed in front of the grand stand. The other car also is a White steamer and is a combination touring car and ambulance, the idea of James E. Plew, of the White company's Chicago branch. Ordinarily a touring car, the backs of the front seat fold backward, which makes either one or two comfortable cots in the tonneau. This car will be stationed at Lowell.

Camp For Officials

A camp for the officials has been established, a unique idea that has been brought about by the skimpy hotel accommodations. The camp is located on the big 80-acre lot where the soldiers will

pitch their encampment. Oliver G. Temme, bearing the high-sounding title of commissary general, is in charge of the officials' camp and he has prepared accommodations for eighty, which will include forty of the flagmen who are working under the direction of Frank B. Wood. Tents galore have been erected, cooks and other servants hired and for the rest of the week the officials will live in comparative luxury, while others are scouting around for sleeping and eating accommodations.

Eighty flagmen are being used for guarding the roads during the practice which began Monday afternoon, forty of whom are students from the Chicago School of Motoring. It was found necessary to do the practising in the afternoon because of the fact that the farmers of Lake county do a big milk business and they objected to closing the roads in the early morning as is done in the Vanderbilt. They also objected to permitting the practising to begin on Thursday as originally scheduled, so the general executive issued the edict that not until Monday would the flagging service be instituted. This, however, did not prevent the drivers from becoming busy in the early morning hours, although they were somewhat handicapped by having to go slowly through both Crown Point and Lowell. Also the road was not completed all the way around, so this practice was generally unsatisfactory, although it did permit the drivers to study the road and be in a position to take advantage of this knowledge when they were turned loose and permitted to burn it. Arthur Greiner, the one amateur entrant, was denied this by a turn of hard luck. Just as he was preparing to move to his camp he was stricken with a touch of malaria, which forced him to go to the hospital instead of Crown Point and for several days he chafed and worried while his rivals were stealing a march on him. Greiner was further handicapped by his unfamiliarity with the Renault which he is to drive. He got it only for this race and up to the time he went to the hospital he had not had a chance to drive it.

Officials of the Meet

Officials chosen for the race show that the Chicagoans have endeavored to get the best talent possible. They selected Asa Paine, of Minneapolis, for referee, and Fred J. Wagner, of New York, for starter. Then they picked a home man for clerk of the course, Charles P. Root. Boston was called upon to furnish the chief timer, sending Harry Knights, whose reputation at this sort of work is national. The judges include John Farson, John C. Eastman and Fred D. Countiss, of Chicago; H. O. Smith, of Indianapolis; Judge W. C. McMahon, of Crown Point, Ind., and Judge V. S. Reiter, of Hammond, Ind. Frank B. Wood, of Elgin, Ill., is chief flagman and Bick Edwards, of Chicago, has been given charge of the electric timing apparatus. The commissary general is Oliver G. Temme, of Chicago.

LOCOMOBILE ENGAGES CROWN POINT GARAGE FOR CAMP

MAISONVILLE, CORBIN DRIVER

STUTZ AND MONSEN

MARION HEADQUARTERS RIGHT IN CROWN POINT

Dead Horse Hill-Climb

WORCESTER, MASS., June 12—Breaking his own record of 55⅕ seconds, made in 1908, L. F. N. Baldwin, in a Stanley steamer, clipped the record of the Dead Horse hill-climb 1⅕ second and made a new mark of :54 flat for the climb. The little machine, leaving behind it a cloud of dust, fairly flew up the steep incline to the judges' bench while the iron-nerved veteran at the wheel, a smile on his face, appeared the least concerned at the achievement of any of the vast throng witnessing the race.

There was practically no one in the running with the Stanleys, David Bruce-Brown having been in an accident the previous evening with the big Benz grand prix racer which put it out of the running, and Billy Bourque meeting with an accident previous to the race in the Knox machine.

Next to Baldwin's performance was that of Harry F. Grant in the American Locomotive, making the hill in 1:03⅘ in the free-for-all event for gasoline motors. Outside of these two cars, the best time on the climb was made by B. A. Swenson, of Springfield, on an Indian motor cycle, which went over the hill in 1:07⅖.

STANLEY MAKING A RECORD

Long before the time for the races to start, a large crowd filled the edge of the roadway the entire length of the incline. By the time the motors were ready to start, fully 40,000 people were lined up along the route. The weather, though warm, was ideal for the event. Up to the ½-mile post the roadway was as smooth and as hard as a piece of glass. Beyond the ½-mile post there was a slight roughness in the road and the second incline to the finish was as smooth as the first.

The first car to come over the course was the Allen-Kingston 48-horsepower roadster with C. A. Glenworth driving. The car traveled smoothly up the first incline and across the level to the second incline, but the light weight in the rear caused a slight skidding of the back wheels as the second ascent was reached. In another event Glenworth's car was ditched while the driver was reaching for a control lever. The machine was not overturned, Glenworth speeding it out of the ditch to the roadway again. This was the nearest approach to an accident during the contest.

Six Buick cars were entered, J. B. Ryall driving five of them and making the climb the greatest number of times of anyone—six times in all. He made the climb in 1:22⅕, the machine losing time across the plateau between the two hills. C. M. Stanley drove two Buicks and his best time was 1:39.

The Chalmers-Detroit cars, eight in all, made fast time over the incline, running evenly throughout the course and buckling down to the roadway in fine style. L. B. Lorimer made the best time of the Chalmers-Detroit drivers, going the course in 1:11, while with two exceptions all of the Chalmers-Detroit cars managed to make the hill within a few seconds of this mark.

In the high-priced gasoline car class the Simplex, driven by Fred K. Burnham, of

TIMES MADE IN DEAD HORSE CLIMB AT WORCESTER

Name of Car	H. P.	Cyl. Bore	Piston Stroke	Entrant	Driver	Time
Gasoline Cars—Piston Displacement 451 to 600 Cubic Inches						
Allen-Kingston	48 4	5½	6	LeRoy Moody	Hugh Hughes	1.09 2-5
Allen-Kingston	48	5½	6	V. J. Jacobs	C. A. Glenworth	1.16
Gasoline Cars—Piston Displacement 301 to 450 Cubic Inches						
Chalmers-Detroit	40	5	4¾	J. S. Harrington	F. F. Cameron	1.19
Chalmers-Detroit	40	5	4¾	J. S. Harrington	L. B. Lorimer	1.20
Buick	32.4	4½	5	J. B. Ryall	J. B. Ryall	1.22 2-5
Atlas	50	4½	4½	Atlas Motor Co.	Elmore Knox	1.25 4-5
Gasoline Cars—Piston Displacement 231 to 300 Cubic Inches						
Columbia	28.9	4¼	4½	Macker-Tyler Co.	J. J. Coffey	1.34
Gasoline Cars—Piston Displacement 161 to 230 Cubic Inches						
Chalmers-Detroit	20.5	4	4½	J. S. Harrington	F. F. Cameron	1.51 1-5
Buick	22.5	3¾	3¾	J. B. Ryall	J. B. Ryall	1.54
Gasoline Cars—Piston Displacement 160 Cubic Inches and Under						
Buick	19.6	3½	3¾	J. B. Ryall	J. B. Ryall	2.05 1-5
Motor Cycles—Any Make						
Indian	7			B. A. Swenson	B. A. Swenson	1.07 2-5
Indian	7			Hendee Mfg. Co.	C. Gustavison	1.09 3-5
Reading Standard				C. E. Dunkle	C. E. Dunkle	1.57
Free-for-All—All Types and Motive Power						
Stanley	30			Macker-Tyler Co.	L. F. N. Baldwin	.54
Amer. Locomotive	54.1	4¾	5½	Park Sq. Auto Station.	Harry F. Grant	1.06
Chalmers-Detroit	40	5	4¾	J. S. Harrington	L. B. Lorimer.	1.11
Amateur Events—Owners to Drive						
Stanley	30	4½	6½	Jay Clark, Jr.	Jay Clark, Jr.	1.13 1-5
Chalmers-Detroit	40	5	4¾	J. S. Harrington	J. S. Harrington	1.18
Amateur Events—Open to All						
Buick	32.4	4½	5	J. B. Ryall	J. B. Ryall	1.25 4-5
Chalmers-Detroit	40	5	4¾	C. H. Page	C. S. Hall	1.44
Gasoline Cars Selling for $850 to $1250						
Buick	22.5	3¾	3¾	Norcross Auto Co.	C. M. Stanley	1.49
Buick	22.5	3¾	3¾	J. B. Ryall	J. B. Ryall	1.54 1-5
Cameron	24.2	3⅞	3½	Cameron Car Co.	Mr. Cameron	2.06 2-5
Free-for-All Gasoline Cars—Piston Displacement 451 to 600 Cubic Inches						
Amer. Locomotive	54.1	4¾	5½	Park Sq. Auto Station.	Harry F. Grant	1.03 4-5
Allen-Kingston	48.4	5½	6	LeRoy Moody	Hugh Hughes	1.07 4-5
Allen-Kingston	48.	5½	6	V. J. Jacobs	C. A. Glenworth	1.13
Free-for-All Gasoline Cars—Cylinder Displacement 350 Cubic Inches or Less						
Columbia	32.4	4½	4¾	Macker-Tyler Co.	J. J. Coffey	1.08 4-5
Buick	32.4	4½	5	J. B. Ryall	J. B. Ryall	1.22 1-5
Gasoline Stock Cars Selling for $1,251 to $2,000						
Buick	32.4	4½	5	J. B. Ryall	J. B. Ryall	1.22 4-5
Jackson	36.1	4¾	4¾	E. P. Blake	H. M. Bates	1.27 2-5
Cameron	36.3	3⅞	3½	Cameron Car Co.	Mr. Cameron	1.36 3-5
Buick	32.4	4½	5	Norcross Auto Co.	C. M. Stanley	1.39
Chalmers-Detroit	30	4	4½	J. S. Harrington	F. F. Cameron	2.02
Gasoline Stock Cars Selling for $2,001 to $3,000						
Chalmers-Detroit	40	5	4¾	J. S. Harrington	F. F. Cameron	1.14 1-5
Atlas	43.5	4½	4½	Atlas Motor Car Co.	Elmore Knox	1.22 4-5
Chalmers-Detroit	40	5	4¾	C. H. Page	L. B. Lorimer	1.26
Gasoline Stock Cars Selling for $3,001 to $4,000						
Allen-Kingston	48.4	5½	6	LeRoy Moody	Hugh Hughes	1.10
Allen-Kingston	48	5½	6	V. J. Jacobs	C. A. Glenworth	1.16 2-5
Gasoline Stock Cars Selling for $4,001 and Upwards						
Simplex	60	6.1	5¾	F. R. Burnham	F. R. Burnham	1.08 1-5
For Record of Hill—Open to All						
Stanley	30			Macker-Tyler Co.	L. F. N. Baldwin	.55 1-5
Amer. Lomotive	54.1	4¾	5½	Park Sq. Auto Station.	Harry F. Grant	1.05 3-5
Chalmers-Detroit	40	5	4¾	J. S. Harrington	L. B. Lorimer	1.12

Results in a New Record

LORIMER IN THE CHALMERS

New York, made the course in 1:08⅕. Burnham was slow in getting under way, but once on the hill his machine developed speed rapidly. Elmore Knox, driving an Atlas car, made a good showing in the second event, traveling easily up the incline, although failing to develop fast speed. He covered the climb in 1:25⅕.

Two Columbian gasoline cars were run, the lighter machine running alone in the third event and making the hill in 1:34. The 32-horsepower Columbia, although making slow time on the first half of the climb, made up for it on the second half and ran the course in 1:08⅕.

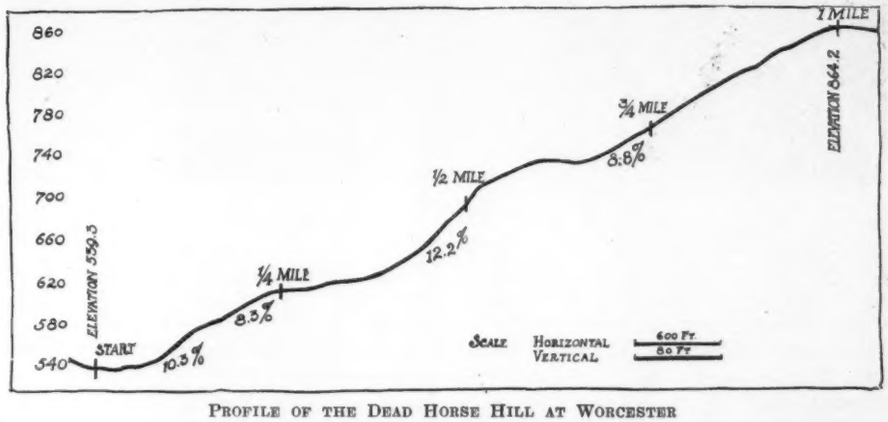
When announcement was made that the Benz was out of the race there was a murmur of disappointment along the line. The interested ones had followed the trial heats of the machines on the hill closely and when Bruce-Brown and his friends claimed that he had covered the course in 50 seconds flat in the trial heats it looked as if there would be something doing when the Benz car was pitted against the Stanley. Brown, after making the climb, returned to the bottom of the hill and started to again climb the incline. When about half-way up he met Broad coming down in a small Stanley. To avoid a collision he turned too far out and the rear wheel of the big machine struck a jagged edge of rock, smashing the running gear. Brown wired at once to Providence to get the other Benz car, but as this was undergoing changes in the shop it could not be had and the event had to be called off.

Near the same spot in the road Billy Bourque came to grief in his Knox car. He was going up the hill for the last time only a few hours before the opening of the races when his machine skidded, and he was ditched. His machine came to a stop about 100 feet further up the hill. Bourque was picked up and hurried to the hospital, but there it was found that a few bad bruises made up the complete list of his injuries. He was, however, too badly lamed up to attempt the climb.

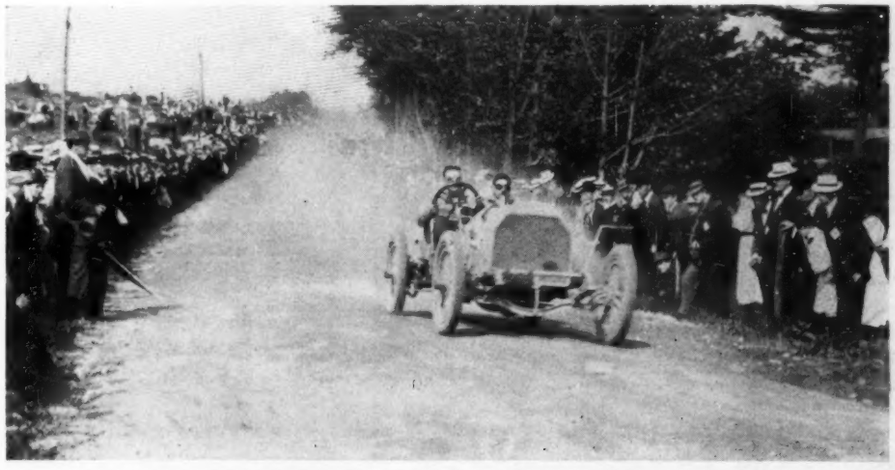
J. B. Ryall, in a Buick, and Broad in a Stanley, bumped cars while a motor in the Stanley machine was being adjusted. No damage was done by this collision.

President John P. Coughlin, of the Worcester Automobile Club, under whose auspices the climb was held, stated at the close of the day that it was a big success. There were upward of 1500 cars parked along the course, while fully 300 more were left outside the fence, arriving too late on the course to be permitted to park with the others.

The officials in charge of the climb included President L. R. Speare, of the A. A. A., referee; starter, F. J. Wagner, of New York; judges, J. Fortesque, of Boston; A. E. Bliss, of Malden, Mass.; W. H. Chase, of Leominster; S. L. Haynes, of Springfield, Mass.; Frederic Tudor, of Boston; John Heinz, of Lowell; E. P. Charleton, of Fall River; A. E. Lerche, of Springfield, Mass.; E. H. Walker, of Brockton; Charles F. Smith, of Fitchburg, and A. D. Converse, of Winchendon; announcer, H. J. Murch.



PROFILE OF THE DEAD HORSE HILL AT WORCESTER



GRANT IN AMERICAN LOCOMOTIVE MAKING BEST GASOLINE TIME

COFFEY IN THE COLUMBIA IN ONE OF HIS TRIALS

Cleveland Holds Climb

WHITE GASOLINE CAR IN CLIMB AT CLEVELAND

CLEVELAND, O., June 10—Following a 10-mile endurance run from the end of the brick pavement near Brecksvill, O., to Porter hill, in which many machines met their Waterloo, and several hours' work in preparation of the hill, the annual hill-climb of the Cleveland Automobile Club was held Wednesday despite all attempts of the weather man to prevent. It was not until early Wednesday morning that it was definitely decided to hold the climb. This late decision made it impossible for many of the entrants to take part in the contest. Of the twenty-one events scheduled on the program but eleven were run, and these were followed by the motor cycles, three of which made the climb, and Mrs. K. R. Otis, the well-known Cleveland driver, in a Stearns.

The Knox car came out first in respect to honors both as to the number of firsts and the best time made. Four firsts were registered by this car, and in the tenth event, for stock cars weighing 2,204 pounds, the Knox, driven by Belcher, took the ½-mile grade in 39⅘. The Hupmobile created much speculation when the first attempt was made to negotiate the grade, and as the top of the hill was neared the little machine appeared almost like a speck compared with many of the other cars.

Despite the threatening weather conditions fully 200 machines were lined up in the paddock when time was called and the the first scheduled event was run. The rain the night before gave the farmers in the vicinity of the hill a golden excuse for a day off, and they came afoot and horseback and in all manner of conveyances to assist in making the day a gala one. Early arrivals were compelled to use chains to make the ascent, but after a steel road grader was pressed into service and cars sent up and down repeatedly, by 1:30 the road was in fairly good shape, though rather slippery. This accounts for the fact that the fast time of last year, when the Stoddard-Dayton took the honors, was not equaled.

Aside from the work of the Knox, the showing of the Oakland, was very good, their best time for covering the distance being :55⅘. The Regal, Hupmobile and Jackson also made good showings in the various events.

Mrs. K. R. Otis, in a Stearns roadster, drew much applause as she drove to the starting line and made the long, heavy climb in :51⅕. This bettered her last year's time by 3⅖ seconds, but her drive was not a part of the regular program, as the rules of the A. A. A. will not permit a woman to drive in any events sanctioned by that body.

In the motor cycle event the Indian, with A. W. Strople up, made the climb in :42½. All the events were well run and there appeared to have been considerable work in advance, as the majority of the contestants were thoroughly familiar with the hill. The officials in charge did their work well and as quickly as could be expected under existing conditions, and little confusion appeared in the handling of the meet. Summaries:

CURVE ON CINCINNATI'S HILL

EVENT NO. 1—STOCK CARS, LIST PRICE $850

Hupmobile	.20	Rauch	2:16 3-5

EVENT NO. 2—STOCK RUNABOUT CARS, LIST PRICE $851-$1,250

Regal	.30	Schmidt	1:19 3-5

EVENT NO. 3—STOCK RUNABOUT CARS, LIST PRICE $1,250-$2,000

Oakland	.40	Bauer	:55 4-5
Oakland	.40	Dennison	:59 1-5
Jackson	.40	Paxon	1:33 3-5

EVENT NO. 4—STOCK TOURING CARS, LIST PRICE $1,251-$2,000

Oakland	.40	Dennison	:59
Pullman	.40	Hardesty	1:12

EVENT NO. 5—STOCK RUNABOUT CARS, LIST PRICE $2,001-$3,000.

Knox	.40	Belcher	:48 4-5
Pullman	.40	Hardesty	1:08 3-5

EVENT NO. 6—STOCK TOURING CARS, LIST PRICE $2,001-$3,000

White gasoline	.45	Camra	1:11
Chalmers-Detroit	.45	Davis	1:36½

EVENT NO. 7—SIX-CYLINDER STOCK CARS

Mora	.30	Adams	1:15 2-5

EVENT NO. 8—STOCK CARS WEIGHING 881-1,432 POUNDS

Hupmobile	.20	Rauch	1:51

EVENT NO. 9—STOCK CARS WEIGHING 2,204 POUNDS

Knox	.40	Belcher	:50 2-5

EVENT NO. 10—OPEN TO ALL MAKES MOTOR VEHICLES

Knox	.60	Dennison	:39 1-5
Jackson	.40	Paxon	:57 2-5
Mora	.30	Adams	1:30 ½

PISTON DISPLACEMENT HANDICAP FOR GASOLINE CARS

Car and driver	Per cent efficiency
Knox, Belcher	89
Jackson, Paxon	76
Oakland, Bauer	71
White gasoline, Camra	55
Mora, Adams	50
Hupmobile, Rauch	22

CLIMB FOR CINCINNATI

Cincinnati, O., June 15—A hill-climb is the offering on the Automobile Club of Cincinnati program for Saturday, June 26. It will be held at Fort Archiert, a government reservation 38 miles from this city, a place internationally known on account of its prehistoric mounds. The course is about 5,000 feet in length and divides itself into practically two divisions, the first half being a grade of from 5 per cent to slightly over 15 per cent. The latter division or quarter is on the level, giving all cars an equal chance for a finish.

MRS. OTIS IN CLEVELAND CLIMB

There are three curves and the contest committee, Dr. G. M. Allen, chairman, is having the sides of the pike banked and straightened at these points. Fort Archiert hill is a well-constructed pike 30 feet in width and the Automobile Club of Cincinnati is making a liberal expenditure to insure safety. A company of the Ohio National Guard will protect the course during the series of events and about 2,400 feet of heavy fencing has been constructed along the latter end of the course to keep the crowd off the track. Six events have been arranged for cars valued at $850 and under up to $4,001 and over, and one event, free-for-all, and one for club owners drivers. In addition to the eight cups to be awarded, $100 in cash will be given to the first in the free-for-all and a $50 cash trophy as second prize. A number of entries are reported from a distance. The Automobile Club of Cincinnati now numbers 525 members and the Fort Archiert hill-climb is almost the sole topic at the clubrooms. Last year the hill used was in the city and Walter White's accident occurred because of the crowds.

ANOTHER SPEEDWAY PLANNED

Cincinnati, O., June 15—Plans are now underway for a motor speedway near Latonia, a Kentucky suburb of Cincinnati, and the promise for a realization of the project seems exceptionally good at this time. A company known as the Cincinnati Auto Park Co. has just been incorporated in the sum of $10,000 with the privilege of increasing the capital stock to $150,000. Those behind the new motor course and park are Harvey Meyers, president of the Latonia Jockey Club; J. B. Earle, president of the First National bank, of Latonia, Ky., and Dr. R. Lee Bird, president of the Deposit bank, also of Latonia, Ky. Options at present are held on 65 acres of fine level ground on the banks of the Licking river, the Louisville & Nashville railway and at the end of the Rosedale electric railroad, 35 minutes' run by electric traction from Cincinnati, and an 18-minute run by steam railway. The present tract would allow a 1¼-mile track, and it is altogether possible that more ground will be secured if needed to work out the idea. It is planned that the extreme accessibility of the proposed park by steamboat, electric traction and steam railroad with the great popularity of motor racing and the proximity of more than half a million people gives the proposition an advantage that should not be underestimated. At present Cincinnati has no motor course, though the home of one of the largest and most progressive motor clubs in the central states.

START OF CINCINNATI'S HILL

MORA, DRIVEN BY ADAMS, IN CLEVELAND CLIMB

CALL IT POLICE OUTRAGE

Indianapolis, Ind., June 14—Much indignation has been aroused over the shooting last Tuesday night by the police of Samuel W. Dowden, a prominent attorney, who was riding in a motor car driven by W. Richardson Sinclair. The shooting occurred while the police were running down Sinclair with the police emergency touring car. In the police car were Chief Robert Metzger, Captain Adolph Asch, Sergeant Charles Barmfuhrer and Chief Adelbert Wilson, of the Oakland, Cal., police. Chief Wilson was being shown the police substations when Mr. Sinclair's car was noticed violating the speed law. Mr. Sinclair admits he was running about 35 miles an hour, but did not know the police were pursuing him. The police began pursuit, following the car eight squares. The Sinclair car was finally slowed down and turned into a side street, on the way to Beck's garage. The police car was running at such speed it could not make the turn and as it passed the street intersection Chief Metzger gave the order to fire. The first shot struck Mr. Dowden in the left leg, but the second missed the mark. The police say they were shooting at the tires and fired three shots. Mr. Sinclair, Mr. Dowden and several witnesses say only two shots were fired. Mayor Bookwalter has asked the board of public safety to remove the chief, but the board has refused to act. It is understood that the mayor will remove the chief himself some time this week. He has characterized the affair as deplorable and indefensible, but has not indicated what he may do. All of the local newspapers have demanded that Chief Metzger be removed. Motor car owners held an indignation meeting last Friday night, A. C. Newby, of the National Motor Vehicle Co., presiding as chairman. H. O. Smith, of the Premier Motor Mfg. Co.; Howard Marmon, of the Nordyke & Marmon Co.; Frederick M. Ayres, a merchant; Robert A. Brown, an attorney, and Frank Staley, the Studebaker representative, were appointed a committee to draft resolutions. At the meeting there were no complaints at enforcement of speed laws, but objection was directed at the drastic method employed in the Dowden case. Only recently the police made a rule that motor cars might run north of Fall creek at a rate of 20 miles an hour without being molested. The matter is creating great interest in the city.

FT. ARCHIERT HILL AT CINCINNATI

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The Light Car in 1910—Disobedience and Accidents

WHATEVER predictions were made 2 years ago, or last year, or this year, for that matter, regarding the unpopularity of the runabout and other light-body types, are further and further from the mark as 1910 announcements are made. Nineteen hundred and ten will undoubtedly prove a season for light cars with small bodies, accommodating three or four passengers. It was not generally anticipated 1 year ago that these selfish cars, as they were styled, would continue in popularity, but they are. Their continuance is not a prima facie evidence of selfishness, but rather an indication of the practical in motoring. In the earlier days the seven-passenger car was considered correct, no matter whether the owner's family consisted of two or four. This large type of car will continue, but a big fraction of the great masses are today not buying with the object of continuous entertainment of their friends, but for their own needs. This is but another method of interpreting the fact that the motor car is no longer a curiosity, but a daily necessity. This body tendency is satisfactory proof of the commercial phase to which even the pleasure car is subjected.

THE increased popularity for 1910 of the light car will be one of the factors of the year. Several conditions have combined to bring this about. The advent of the taxicab has proven satisfactorily the superiority of the small car for city use when congestion is a serious problem. The shorter wheelbase makes it possible to maneuver in places where a longer wheelbase is a serious obstacle. The smaller car means lighter weight and lighter weight means increased responsiveness to motor demands for a given horsepower. Within the last year, or 18 months, the trend toward bringing out smaller sizes has been general in every country. Not to be overlooked is the reduced tire wear on a small and light car, as compared with a heavy large one.

ALREADY the list of fatal accidents, due to careless road driving and entire disrespect of the accepted rules of the road, has risen. In some cases recorded these accidents have proven fatal; in others they have been confined to the destruction of car property and with others to a combination of personal injuries and car destruction. Over 50 per cent of road accidents due to violation of the road laws, which have come under the attention of Motor Age within the last 6 weeks, have been due directly to cutting corners and passing slower-moving vehicles to the right-hand side. The corner-cutting trouble predominates, careless drivers persisting in keeping as close to the inner curb in a left-hand turn as possible, and not keeping to the right of the point marking the intersection of the two streets. Although few accidents have been occasioned by passing slower-moving vehicles on the right-hand side, the act is a treacherous one, in that it destroys all possible confidence in road rules. The driver of a horse-drawn vehicle who is passed by a motor car on the right-hand side once, is uncertain thereafter as to whether the motorists will overtake him on the left-hand side, which is proper, or on the right-hand side; and one violation of this upsets the complete calculations of a horse driver, or any other driver. A large percentage of the cases of overtaking on the right-hand side are due to the slower-moving vehicles being in the center of the road, or perchance nearer the left-hand side than the right-hand side. Because a driver of another vehicle is disobeying the road rules is no right for another driver to do it. If every motorist insisted on the drivers of vehicles which are overtaken keeping to the right side of the road, irrespective of the trouble caused thereby, the rules of the road would soon be respected as they should be; but so long as the motorists follow the course of least resistance, namely, going to the right or left-hand side of the road when overtaking a slower-moving vehicle according as to which side of the road has the more open space, there will not be that respect for the rules of the road, and accidents will continue to happen, and motorists will continue to say that the drivers of horse vehicles do not know how to drive and drivers of horse vehicles will in turn say that the drivers of motor cars don't know how to drive. The error of the horse driver is no license for the motor driver to err, but let every motorist do right, even if it is more difficult than to do wrong.

THE spirit of speed is inate in the heart of man. Some men operate in a sphere of activities where it is possible to demonstrate the exact degree to which this instinct dominates the individual; others, less fortunate—perhaps more fortunate—have not the wherewithal or the environment to demonstrate that such a force lies dormant in the man; but whether this force is demonstrated or not, it exists; and, thanks to this, it is the spirit that moves the world along. In motoring, one of the expensive evidences of this is the driver who delights in starting quickly and stopping quicker. The start is a speeding of the motor, a dropping in of the clutch, spinning of the rear wheels, and a plunge ahead. The result: The road surfaces are unnecessarily destroyed if it is anything but asphalt, the tires are needlessly worn, and the entire car strained as a result of the whimsicalness of the driver. In stopping, instead of reducing speed by motor control, the grand stand driver resorts solely to the brakes, slipping the rear wheels so that for perhaps 20 feet before the car comes to a stop these tires are slipping on the surface.

THAT the love of money is the root of motoring legislation is becoming self-apparent, although not a few municipalities announce that it is the necessity of money that promotes motoring legislation. Chicago has had two evidences of this within the last year. In July, 1907, the licensing of motor cars was taken out of the hands of the city and placed under state control at Springfield, thereby transferring the city revenue from the city coffers to those of the state. Eighteen months ago the municipality of Chicago suddenly awakened to the fact that it needed revenue; hand-in-hand with this was the nightmare that they lost revenue by the state licensing; and now a bill has been forced through the state legislature legalizing the levying of wheel taxes on all vehicles. The wheel tax means a revenue source of $12 from each runabout and from $20 to $30 for bigger cars per year. The state of Illinois apparently seeing that the Chicago motorists have accepted the wheel tax situation and are willing to make annual donations to the city treasury, decided to get more money from the motorists and now has passed a bill making it an annual fee of $2 for each car's state license, whereas, heretofore, the original $2 has been continuous from year to year. Where this licensing phase will stop is difficult to know. It is a foregone conclusion, however, it will not stop until the motorists unite and place their demands properly before the governor, legislature and senate, and other governing bodies.

FIVE START IN QUAKER CLUB RELIABILITY

Meager Showing in Entry Line in 5-Day Contest Promoted by Philadelphia Motorists

WILLIAMSPORT, June 14—With a beggarly array of five starters, the Quaker City Motor Club this morning launched its 5-day endurance run to Pittsburg and return. Various reasons have been given for the paucity of entries—lack of cars, preparations for 1910, etc.—but the fact remains that this territory has had a surfeit of endurance and reliability runs for this season, and the Quakers made the mistake of scheduling their run too late in the season or, failing to secure an earlier date, of not calling the run off altogether. It is going to cost them something like $1,200 to see the affair through, but, like true sports, they are going to do it.

Today's story is soon told. Shuttleworth's 40-horsepower Haynes, the only class C entry, snapped its front axle at Lavelle, 75 miles short of the overnight stop, and under ordinary conditions would have retired. But Shuttleworth is after the cup, and wired to New York for a new axle. He hopes to get it tonight, and wired for and received permission to check out tomorrow morning if he can get here in time.

The Palmer & Singer covered the last 25 miles of today's run with two broken front springs, but by means of a first-aid repair got into the control on time. New springs will be fitted tonight, and it will check out as usual in the morning, but with an incubus of demerits which makes its chances against the Carris Franklin and Hardart's Elmore decidedly slim.

The Franklin and the Elmore—the latter driven by Frank Hardart, Jr., the only amateur driver in the run—finished clean for the day in their class, as did Walter Cram's Mitchell 20 in class D. The going was horrible through the mountains, as a result of the incessant rains of last week, and the reduction of the running time to 18 miles an hour was much appreciated by the drivers. Seventy-five of the 191.2 miles of today's run was over and through the successive ranges of the Blue mountains which form the backbone of the Keystone state, between the Delaware and the Susquehanna. Tomorrow's leg of about 146 miles will furnish an even larger proportion of mountain work, and clean scores would seem to be almost impossible, even under the reduced schedule, which is to be continued for another day.

The more than 10-hours' schedule made the box lunches furnished by a Sunbury motorist a godsend to the famished travelers, there being no dinner stop in the itinerary.

Pilot Overpeck, who is acting as referee in the absence of Chairman Ross, of the contest committee, who was called out of town, was compelled to transfer his flag to the Palmer & Singer, a troublesome clutch delaying the official Chalmers-Detroit to such an extent that it was overtaken by the former at Sunbury. Following is a list of the starters:

No.	Name of car	H.P.	Driver
	CLASS A		
5	Elmore	35	F. Hardart, Jr.
13	Franklin six	42	C. C. Harris
1	Palmer & Singer six	60	W. Wallace, Jr.
	CLASS C		
4	Haynes		W. E. Shuttleworth
	CLASS D		
6	Mitchell	20	W. McCraw

Second Day of Run

Johnstown, Pa., June 15—The 18-miles-an-hour schedule obtained again today, and with the large proportion of low-gear work due to the mountains and the heavy going in many places, the reduction came in quite handy. Although four of the five cars finished clean, none of them had much time to spare. Between Williamsport and Lock Haven and from Altoona to Johnstown there were many miles of roads with rute a foot deep, and the few stretches of state road met with witnessed some bursts of speed that would do credit to a Vanderbilt cup race.

The surprise of the day was the appearance in Williamsport at 6 a. m. of the Haynes, which suffered a broken axle 75 miles shy of that place. Driver Shuttleworth and his assistant, with the aid of a fence rail and a little ingenuity, managed to get their car to Ashland, where a new axle, wired for to New York, reached them at 11 o'clock at night. They were back on the course again at 1 o'clock this morning, and reached Williamsport in time to get a bite of breakfast before checking out. The Haynes' multiplied penalties will be worked out by the contest committee on the return of the men to Philadelphia on Friday night.

There was some delay in the arrival of new springs for the Palmer & Singer, which limped into Williamsport yesterday with both front springs gone, and the car did not check out from that place till 8:45 this morning. By taking all sorts of chances, and pushing through with but one 3-minute stop, for fuel, the car arrived here 6 minutes ahead of its schedule.

The only car to suffer a penalty today was the Haynes. Yesterday's experience made Driver Shuttleworth a trifle too careful, and he failed to allow sufficient time for the mountain work between Altoona and this place; he checked in 15 minutes late. He is determined to land the Class C cup, and as the Haynes is the only car in that class he says he will not mind the addition of a few extra points to the large total accumulated yesterday.

Van Sicklen, Sr., Joins Blue Book

The rapidly increasing demand for touring information in all sections of the country has necessitated a larger organization to carry on the work of the Official Automobile Blue Book, and a new corporation, with largely increased facilities, has been organized, under the incorporated name of the Automobile Blue Book Publishing Co. N. H. Van Sicklen, Sr., former owner of Motor Age, and recently Chicago branch manager for the Knox Automobile Co., and one of the most widely known men in the motor industry, is president of the new corporation, and he, with the former owners of the Blue Book, will constitute the board of directors. Mr. Van Sicklen will immediately inaugurate a strong campaign for the extension of the Blue Book's scope and influence, so as to practically cover the entire United States, Canada and Mexico. Headquarters will be located in Chicago and New York. The Official Automobile Blue Book is now recognized as the standard route book for this country, and under Mr. Van Sicklen's management, the new corporation will extend its work to cover every requirement of the motor tourist.

Want a 24-Hour Race

Baltimore, Md., June 14.—Announcement was made late today that the Motor Car Racing Associati[illegible]f Maryland would hold a 24-hour meet at the Benning race course, just outside of Washington, D. C., on July 16 and 17. The event will be the first twin-city meet ever held in this section of the country. The races will start at 2:30 o'clock Friday afternoon, July 16. The first events will consist of two 25-mile races, two 10-mile races and two 5-mile races, strictly for stock cars, which will be arranged in classes according to horsepower. The 24-hour race will start at 8:30 Friday evening and will be open to stripped stock cars. The mile track at Benning will be thoroughly overhauled for the events and this work will be started next week. Course will be thoroughly oiled and the lighting arrangements will be the best after tried in this section.

Glidden White Uses Kerosene

Cleveland, O., June 14—The 40 horsepower White steamer which has been entered for the Glidden tour will make the 2500-mile trip using kerosene as fuel instead of gasoline. This will be the first extensive public performance, either in this country or abroad, by a car using any fuel other gasoline. The fact that this will be the only car entered by the White company makes it evident that the company have the most complete confidence in the new kerosene burner, and do not anticipate that any penalizations will result through the use of this new fuel. The car will be driven by H. H. Searles, who for 2 years was enrolled in the United States secret service.

PLEASANT TOUR THROUGH THE MOUNTAINS

NEW YORK, June 15—Ideal touring conditions — fascinating scenery, magnificent roads, nearly perfect weather —and an endurance contest in which a dozen of seventeen starters finished with perfect scores, were experienced by those who participated in the week-end tour of the New York Automobile Trade Association. Leaving the busy city on Saturday morning for Catskill, thence to the Berkshire hills on Sunday, and a run from Pittsfield to the metropolis again on Monday, gave a route replete with scenic grandeur, and on such splendid highways as to mark this 350-mile trip as one of coming wide popularity. Ramapo hills, Catskill mountains, and the far-famed Berkshires, interspersed with glimpses of the Hudson and other rivers, can furnish as many beautiful vistas as found within a short radius of any large city. The contesting nature of the tour introduced a spiciness which lent particular interest, and the rules were not so rigorous as to detract from the pleasures of leisurely touring.

White, Franklin, National, Knox, Franklin again, Oldsmobile, Columbia, Mitchell three times, Inter-State and Thomas taxicab were the makes which traveled the 351.2 miles on a time schedule with checking stations at frequent intervals, without being late or having to make adjustments upon the roads. Stevens-Duryea, Stoddard-Dayton and Mitchell were penalized, and Stoddard-Dayton and Standard withdrew, but continued as non-contestants. The one free-lance of the party was a Lancia. The cars which were penalized or withdrew were the victims of slight derangements which would be overlooked in ordinary touring, or perhaps prevented, but which in a contest caused considerable of a disturbance.

Only one serious mishap occurred, and that was to a touring car which was making its debut in metropolitan trade circles, the Standard, a production of the Standard Roller Bearing Co., of Philadelphia. In rounding a corner in Kingston, N. Y., the car skidded and broke a wheel against a curb. A new one was sent all the way from the Quaker City and the car joined the contestants at Catskill. The big six-cylinder Stevens-Duryea ran out of gasoline just as it was about to cross the line at Catskill, and after it had stood at the checking station for 20 minutes with its motor running. It took some time to procure gasoline and 14 points were thereby rung up on the finish judge's register. A. H. Whiting's Stoddard-Dayton broke a gasoline feed pipe and after fixing this, and securing a fresh supply of the valuable liquid the car was so late that its entrant decided to withdraw, and run as a non-contestant on the last day. The Stoddard-Dayton entered and driven by R. T. Newton had to break a seal for a carbureter adjustment, at a cost of 6 points, and O. R. DeLamater had to stop his Mitchell for a roadside adjustment, losing 23 points.

As was forecasted by those who had been over the route, the tourists would be greatly pleased and impressed by the wonderful scenery, and in this they were proven to be correct. The party formed at Columbus circle, New York, on Saturday morning. Suffern was the first checking station, 28.3 miles from the start, and with a schedule of 1 hour and 50 minutes, and the roads were as fine as the best in the world.

After a stop of an hour and a quarter, the party proceeded towards the next checking station, at Highland, regretting that they did not have more of the beauties of the country around Suffern, Tuxedo Park and Arden, but looking forward to the Catskills. From Kingston the cars ran through Esopus, wound for 7 miles to go one into Kingston, and stopped for the night at the Grant house on the outskirts of Catskill. The run of the day had been 125.2 miles in length, and the running time was 7 hours 15 minutes.

An innovation in a tour of the kind was introduced by giving over Sunday morning to the tourists, for runs back into the mountains or for a quiet rest. Each day as soon as the cars were checked into the night control and a count of the seals upon the bonnets was made, the drivers were free to use them as they liked.

Monday's route was the longest, 151.6 miles, and the interest was just as great as on the previous days, for the route led through places which are known all over the country for their beauty, Lenox, Stockbridge, Great Barrington, Sharon, and the Hudson river shores from Poughkeepsie to Yonkers. From the quaint town of Sharon, with its clock tower, wide and shady lawns, and hospitable inn, to Poughkeepsie was a little over 30 miles, and in the city on the Hudson a stop was taken for lunch.

From Peekskill to Yonkers was a quiet parade along the banks of the river, with wide views often seen from the heights, while underneath the roads were as fine as could be desired. From Yonkers into the city was of necessity an easy run. As the contestants arrived at the Automobile Club of America they were immediately checked out, their seals examined, and the cars and drivers released without waiting for the time schedule.

CHANGES IN TOUR ROUTE

Berlin, June 4—Some changes have been made regarding the routes for the Prince Henry tour. By the final selection of the roadway to be followed on the first day from Berlin to Breslau by way of Buckow, Grabendorf, Groditzsch, Liebenrose, Guben, Krossen and Luben, the tourists will have to travel 234.9 miles, or nearly 15 miles more than originally decided. The second day's route from Breslau to Tatra-Lomnicz, also has been changed slightly and the day's run will tally 245.6 miles, being the longest run of the entire tour. Preparations for the great tour are in full swing and never before has there been so much enthusiasm shown by all the officials. It has been reported—but not officially confirmed—that Emperor William will be present at the start.

OCEAN TO OCEAN RACE

Rawlins, Wyo., June 14—The New York-Seattle race is making good progress and the leaders reached this place tonight, the No. 2 Ford being the first one here, having passed the Shawmut at Hanna, Wyo. The other Ford is in Medicine Bow tonight. It was reported here that the Acme broke an axle at Pierce, Colo., this morning and will be hung up until a new part reaches there from Denver. The Itala is in Kansas City, where it is recovering from the accident of Monday when it was struck by a freight train while crossing the Missouri river at Glasgow.

STANDING OF CARS IN THE TOUR OF NEW YORK DEALERS

No. Car.	H. P.	Cyl.	Bore.	Stroke.	Driver.	Penalties. T.	R.	Total.	Tires.
CLASS F—CARS SELLING FOR $4,001 AND OVER									
21—Oldsmobile	60	6	4¾	4¾	F. G. Folberth	0	0	Perfect	Goodrich
CLASS E—CARS SELLING FOR $3,001 TO $4,000									
14—White	40	..	..	..	H. K. Sheriden	0	0	Perfect	Diamond
15—Franklin	42	6	4¼	4	Chas. Fox	0	0	Perfect	Goodrich
18—Stevens-Duryea	40	6	4¾	4½	Frank Eveland	14	0	14	Diamond
CLASS D—CARS SELLING FOR $2,001 TO $3,000									
3—National	35	4	4¾	4¾	W. C. Poertner	0	0	Perfect	Diamond
7—Columbia	29	4	4¼	4½	J. R. Kirkpatrick	0	0	Perfect	Empire
9—Franklin	28	4	4¼	4	J. L. Burns	0	0	Perfect	Goodrich
10—Knox	38	4	4⅞	4¾	J. R. Ripley	0	0	Perfect	Fisk
2—Stoddard-Dayton	40-45	4	4¾	5	R. T. Newton	0	6	6	Firestone
1—Mitchell	40	4	4¾	5	O. R. DeLamater	0	43-43		Hartford
8—Stoddard-Dayton	40-45	4	4¾	5	A. H. Whiting	W'drew		W'drew	Firestone
CLASS C—CARS SELLING FOR $1,251 TO $2,000									
5—Mitchell	30	4	4¼	4½	D. M. Hasbrouck	0	0	Perfect	Goodyear
6—Mitchell	30	4	4¼	4½	M. E. Parrott	0	0	Perfect	Hartford
11—Mitchell	30	4	4¼	4½	W. D. Brown	0	0	Perfect	Hartford
12—Inter-State	35	4	4¼	5	H. H. Knepper	0	0	Perfect	Diamond
22—Standard	30	4	4¼	4½	C. R. Short	W'drew		W'drew	Diamond
CLASS G—TAXICABS CARRYING TWO PASSENGERS AND DRIVER									
20—Thomas	18	4	3⅜	4 5/16	Oscar Housen	0	0	Perfect	Empire

NEW COMPANY WILL MAKE THE COLUMBIA

HARTFORD, Conn., June 12—One more page has been turned in the affairs of the Electric Vehicle Co., of this city, which has been in the hands of a receiver since December 10, 1907. The bondholders of the company through their legal representatives on Thursday filed with the secretary of state a certificate of incorporation of a new concern to be known as the Columbia Motor Car Co., of Hartford. The new company will take over and acquire all and any assets and property, real and personal, of every kind and description of the old concern, that is, the Electric Vehicle Co.

The authorized capital stock of the Columbia Motor Car Co., of Hartford, is $48,000, divided into 480 shares at a par value of $100 each. Of the capital stock, $32,000 represents preferred stock or two-thirds of the capitalization and the remaining one-third represents common stock. The holders of the preferred stock will be entitled to non-cumulative dividends at the rate of 6 per cent per annum before any dividends shall be paid on the common stock. After the payment of 6 percent on the preferred stock, during any year 5 per cent may be paid on the common. After the payment of 6 per cent on the preferred and 5 per cent on the common stock during any year, 4 per cent additional may be paid on the preferred, and further dividends during such year shall be paid on the common. In the event of liquidation, any distribution among the stockholders shall be made first on the preferred stock, to the extent of its par value, second on the common stock to the extent of its par value, and third on both the preferred and common pro rata.

Rather broad are the powers of the directors who may meet at such time and place as they see fit, and they shall have full power to lease, sell, convey or otherwise dispose of the real and personal property of the corporation without the assent or vote of the stockholders if in the opinion of the directors such may not be required by the company in the conduct of its business.

Before the property of the Electric Vehicle Co. can be acquired by the Columbia Motor Car Co. the necessary power to sell must be granted the receivers by the courts of New Jersey. The receivers have applied for the right to sell to a committee of reorganization and the court order is returnable on Tuesday of next week. It is the accepted belief that the manufacture of Columbia gasoline and electric models will be continued as heretofore by the receivers. In a sense, the old faction is still in evidence in the new company, that is the bondholders, among whom are Thomas F. Ryan, Harry Payne Whitney, the Elkins estate, of Philadelphia; the Electric Storage Battery Co., of Philadelphia; Anthony M. Brady and Grant B. Schley. At present the 29-horsepower four-cylinder car is the only gasoline model built by the company. It is stated on good authority that next season the company will bring out a six-cylinder motor with the same stroke and bore as the present, but having a dual system of ignition.

The May report of H. W. Nuckols and H. M. Barrett, receivers of the company, shows sales during the month of $78,411.53. Of the cash receipts $3,630.48 was realized from the Selden patent and of the disbursements, George B. Selden is credited with $37,729.55 and the licensed association with $3,395.20. The balance on hand June 1 was $169,599.50.

ROAD RACING ON COAST

Portland, Ore., June 15—Special telegram—The rose festival road races were run Saturday. Bert Dingley in a Chalmers-Detroit won the Wemme cup race over a course 102 miles in length in 1 hour 40 minutes. The car was entered by the P. K. Keets Co. Sam Christopherson was second in a Stoddard-Dayton, 13 seconds behind Dingley. Murray Page was third in a Locomobile. The decision was protested. The class B race over a 50-mile course was won by Charters Arnold in a Pope-Hartford in 45 minutes 53 seconds. Dingley was second in a Chalmers and Sam Christopherson third. In class C, for runabouts, H. M. Covey, Jr., won in a Cadillac. The course was 14.6 miles and the time was 15 minutes 38 seconds.

The races were held over the Portland race course, a distance of 14.6 miles, in which the longest straight-away is 6 miles. There are two S turns in the course and four other angles to be negotiated in covering the distance. The road was in perfect condition, the surface being sprinkled with oil. The races were under the auspices of the Portland Automobile Club under the following conditions and classifications:

Class A—100-mile event. Open to any stock car of any make, which car was regularly represented and sold by any dealer of the city of Portland 60 days prior to June 12.

Class B—Open to any stock car of any make, which car was regularly represented and sold by any dealer of the city of Portland 60 days prior to June 12. Car cost at the factory $3,000 or less.

Class C—Open to any stock car of any make, which car was regularly represented and sold by any dealer of the city of Portland 60 days prior to June 12, which cost at the factory $1,650 or less.

BROOKLAND WHITSUN MEETING

London June 2—Beautiful weather again favored the second Brookland meeting of the year, both days of which were suitable for good sport, high speed, close finishes and a preponderation of the amateur element. The Saturday card comprised nine races, an exceptional program. Summary:

The Regent cup, open to cars of 23 horsepower, R. S. C. rating, and under—W. L. Stewart, 20.1 horsepower Lancia, won; R. Selz's 21.2 horsepower Vauxhall, second. This was a magnificent race, the Lancia winning by a bare yard at an average speed of 62 miles per hour.

Whitmer junior private competitors' handicap, 5½ miles—Mr. Selz's 21.2 horsepower Vauxhall won; J. L. Farmiloe's 20.1 horsepower Mercedes, second; Milburn's Sizaire, third. This was a thoroughly bad handicap, the Vauxhall only giving 2 minutes to a 61-horsepower Austin runabout. Winner averaged 60¾ miles per hour.

Private match for $1,000—Sir C. S. Forbes' 32-4-horsepower Mandalay won; Mr. L. L. Rolli's 35.7-horsepower Hotchkiss, second. Distance, 11 miles. Winner averaged 58½ miles per hour.

Naval and military cup, 5½ miles—Hyne's 8.9-horsepower Sizaire, 4 minutes, 42 seconds, won; Col. Cowper Essex's 48.6-horsepower Daimler, 37 seconds, second; Sir G. Abercrombie's 39.5-horsepower Napier, third. Gore Browne's Rochet-Schneider passed the post first, but was disqualified for exceeding for more than 5 per cent his declared speed, this being the means whereby the cars were handicapped.

May senior handicap, 11¼ miles, nineteen starters—W. L. Stewart's 21-horsepower Lancia won; S. A. Gibbons' 40-horsepower Iris, second; R. Selz's 21.2-horsepower Vauxhall, third. Among the contestants were a grand prix Itala, a 76-horsepower Mercedes and a grand prix Napier.

May junior handicap, 5¼ miles—R. Selz's 21.2-horsepower Vauxhall, scratch, won; W. L. Stewart's 20.1-horsepower Lancia, 10 seconds, second; R. Jacksons' 6.2-horsepower Jackson, third. Won by 50 yards at 58 miles per hour.

Private match, 8½ miles—P. D. Stirling's 25.6-horsepower Arrol-Johnston won; S. Gore Browne's 24.8-horsepower Piccard Pictet, second.

May 4-mile race—J. W. Stock's DeDion won; P. D. Stirling's Arrol-Johnston, second; C. A. Bird's Beeston-Humber, third. Distance, 11 miles. Winner averaged 71¼ miles per hour.

Whitsun senior private handicap, 11¼ miles, sixteen starters—R. Letz's 21.2-horsepower Vauxhall won; Col. Cowper Essex's 48.6-horsepower Daimler, second; Sir G. Abercrombie's 39.5-horsepower Napier, third. A hot race, won by only three lengths. During this race Astley's 76-horsepower Mercedes created a sensation by covering a lap at 97 miles per hour. Winner's speed, 63 miles per hour.

Third Sizaire-Naudin cup—C. Pinnock's car won; G. H. Cox's car, second; E. Spencer's car, third. One-half mile spurt; eleven starters; speed, 37 miles per hour.

Whitsun winners' handicap—In this race eleven of the eighteen winners of the meeting competed, cars and motor cycles all being handicapped together; 5½ miles—C. Pinnock's Sizaire, 5 minutes, 45 seconds, won; W. H. Wells' 5-horsepower Indian, 2 minutes, 21 seconds, second; R. Selz's Vauxhall, third. The race was badly handicapped, the Sizaire winning from the start. The Indian traveled splendidly.

MEINZIGER'S RECOMMENDATIONS

Detroit, Mich., June 15.—George Meinziger, who recently achieved prominence as the driver of the pathfinding car which conveyed Dai H. Lewis over the route which will be taken by the Glidden tourists in July, is of the opinion that the rules for the tour should be changed to allow of the washing of the cars at controls. He says that the gumbo roads over which a large portion of the tour will lead are of a character which will make driving virtually impossible, unless this is the case. If it rains Meinziger is of the opinion the roads will be in almost as bad shape as they were while the pathfinder was wallowing through them. The mud, he says, sticks where it lights and is not to be gotten rid of in any other manner than by hard work with a sharpened stick.

ORPHAN'S DAY CELEBRATION IN BIG CITIES

NEW YORK, June 14—New York's orphans, nearly 2,400 of them were on Friday treated to one of those outings which is a year-mark in their lives, a real motor car parade, a long ride and the freedom of the wonders of Dreamland, Coney Island. This fifth annual celebration of the orphans' day, now under the management of an incorporation, was the most successful of the quintet of excursions yet given to the inmates of the charitable institutions of the city, and there were about 150 cars in which to entertain them. Rain had caused a postponement of the event from last Wednesday to Friday, but there was no diminution in the interest, either on the part of the small folk or of the donors of the cars, and long before 9 o'clock in the morning cars were reporting to the headquarters of the committee for orders. The various institutions were then visited and the loads of happy children brought to the streets near Columbus circle where they were marshaled into divisions and the parade began. After a run through the city streets, the cavalcade wound around the approach to and then over the new Queensboro bridge and on to Coney Island. Dreamland was thrown open to the two-score hundred orphans.

Not Enough Cars

Philadelphia, Pa., June 14—Postponed from Wednesday last on account of rain, the local orphans' day outing, which took place on the following Friday, was severely handicapped by threatening weather. Of the 126 cars originally offered, but ninety-two reported to Chairman Edwin H. Lewis. These could accommodate but a trifle more than 600 children, and when the start was made for Willow Grove park there was every appearance of a downpour. Fortunately, however, the sun broke through the clouds and before midday usual summer conditions prevailed. With preparations made for 1,000 children, the youngsters had to work overtime in an effort to consume the good things provided for them by the North American. Twenty-one of the city's charitable institutions were represented, and the affair was managed with a precision which reflected great credit upon the committee. Although the turnpike company refused to raise the toll embargo for the orphans' cars, the Evening Times stepped into the breach and footed the not inconsiderable bill therefor.

Celebration at Capital

Washington, D. C., June 10—More than 300 of the city's little wards were given an outing on June 7 by the Automobile Club of Washington. Fifty cars were donated for the purpose of giving the children a ride around the city, after which they were taken to Glen Echo, a summer resort on the conduit road. The grounds and all the amusements of the resort were donated by the management. The orphans' day celebration was originally planned for June 3, but rain caused its postponement until June 10. An all-day picnic for the orphans is now suggested by the club.

Orphans Disappointed

Baltimore, Md., June 13—Just 820 Baltimore orphans were disappointed last Wednesday when the rain spoiled their annual outing. In consequence of the heavy downpour on that occasion, the pleasure tour of the youngsters was postponed a week. Elaborate arrangements had been made by the Automobile Club of Maryland for the entertainment of the youngsters at Electric park. One hundred and seventy-eight cars, through the generosity of as many owners, were at the disposal of the club for the orphans' day celebration. These will be used next week.

How the New York Orphans Were Entertained

GLIDDEN TOUR PROGRESS

Buffalo, N. Y., June 15—The condition of the Glidden tour lists at the end of last week was eminently satisfactory; in fact it has been so from the start. On July 1 of last year, when the tour started on July 9, there were twenty-nine entries in hand and this year there were more than that many paid in before June 1. No new survey has been made of the territory between Minneapolis and Omaha, or Council Bluffs, but good going seems assured by any route. An eastern man who lived 16 years in Iowa and is familiar with the terrible gumbo of that state, of which such dread stories have been told, as he is with the sands of the seashore, where he spends every summer, has this to say about the roads there: "There is no finer surface to be had than that of these same Iowa roads in July. They are then baked as hard as a brick and they are as smooth and as fast as a brick road. Rain does not even make them muddy, so hard are they. This gumbo is a sort of clay, you must know. When wet it is as black as your black hat and when dry it is as white as your white hat. There are 15 feet of frost in the ground out there in Iowa and in the spring, when that frost is coming out of the ground, there are 15 feet of black, sticky mud. It is a fact that horses have been drowned in it. This black clay, or gumbo, is drying out all the spring and gets thoroughly hard and dry the latter part of June. Then it bakes in the sun till it is brick-like and affords a surface fit for racing. So your Glidden tourists, who have shuddered at the stories of the troubles of the pathfinding car in the spring, will be wondering in July where are the bad roads they heard about."

BIG TIME FOR HOOSIERS

Crawfordsville, Ind., June 9—Rain and the bad condition of the roads interfered seriously with the success of the third annual motor car celebration held here today. Visiting delegations were small, few persons coming from cities other than Kokomo and Indianapolis. The parade had to be postponed a short time until after the rain, but when it was held it met every expectation. T. B. Nicholson was marshal of the parade, Finley P. Mount official starter and John C. Snyder, Moreland B. Binford and Frank C. Evans the timers. The parade covered about 3 miles of business and residence streets, being led by members of the committees and officials of the day. Then came the Crawfordsville band on the Rapid truck of Jacques Broth-

ers of Thornton, and a Premier touring car driven by Miss Katrina Fertig of Indianapolis, with whom rode Mayor Voris and officers of the Crawfordsville Commercial Club. About seventy-five cars were in line. There were special events both morning and afternoon and the police department furnished half a dozen additional policemen for the day to handle the crowds and guard against accidents. The hill-climbing contests were held on Bluff hill and the other contests in Green and Market streets. Squares where the contests were held were closed to other traffic and no accidents occurred. There were two hill-climbing contests scheduled, but a third one was held between a Buick and a Stearns car, resulting in the latter winning. There were exhibitions of skillful driving, speed tests for half a mile distances and several novelty races. The slow race furnished much amusement but grew monontous before it was over. This race was run around the court house square, a distance of four blocks. Cash prizes were awarded in each event, the prizes being offered by business and motor car men. Summary:

Hill-climb for one and two-cylinder cars—Buick runabout, W. V. Peterson driver, won; time, :38½.
Hill-climb for four or six-cylinder cars—Stearns, Carl Alfrey driver, won; time, :29.
Hill-climb between Buick four-cylinder, 18-horsepower, driven by W. V. Peterson, and Stearns six-cylinder, 60-horsepower, Carl Alfrey driver, won by latter; time, :28.
Best man driver—Ned Ruddle, Kokomo, driving Haynes.
Best woman driver—Miss Katrina Fertig, Indianapolis, driving Premier.
Slow race—Cartercar, driven by William Davidson, won; time, 38:57.
Potato race—Maxwell, driven by Morris Cochran, won; time, :26¾.
Egg race—Stearns, driven by Carl Alfrey, won; time, :24½.
Half-mile race—Buick, driven by W. V. Peterson; time, :47¾.

FRENCH GET RUSSIAN BUSINESS

Paris, June 3—From records furnished by the government it is shown that French-made motor cars and chassis to the value of $665,600 were imported into Russia during 1908. As the total value of the 866 cars and chassis from all countries imported into Russia is $1,775,500, it appears that, as in 1907, the French manufacturers secured the lion's share. The cars bought by the Russians during the past year consist of 170 commercial or industrial vehicles or chassis, of a total value of $154,760; 124 two-passenger cars valued at $174,900 and 572 four or more passenger cars, valued at $1,445,840. That Russia is a country well worth while taking into consideration by any manufacturers interested in the export business of cars is best evidenced by the official records. Thus, it is shown that for the year 1908 the importations, in dollars, were $863,798 in excess of those of 1907 and $1,274,650 larger than those of 1906. The French and German manufacturers have now among them about two-thirds of the entire motor car business and the British makers are beginning to take a live interest.

National Body Holds Two Important Meetings

New York, June 14—Twenty-five directors of the A. A. A. were in town last week attending the quarterly meeting of the association held on Thursday at the national headquarters. President Lewis R. Speare and several other directors remained after the meeting to perfect some details in connection with the work of the various national boards. In speaking of the work accomplished President Speare laid especial emphasis upon the new racing and contest rules as presented by Chairman Hower, of the contest board, and unanimously approved, and the action taken to discourage the formation of purely promotors' motoring clubs, organized chiefly to hold race meets. It was resolved that hereafter the half-rate price for sanctions to conduct meets allowed to clubs in the A. A. A. should not be granted to clubs which have not held A. A. A. membership for at least 90 days. The sentiment of the association's executive officers was very forcibly expressed to forestall race meets by short-term clubs in the future.

The new racing and contest rules drafted by the contest board and its advisory committee will be printed and issued at once.

The Arkansas State Automobile Association was elected to membership giving the national association its thirtieth affiliated state body. This association comprises clubs in Little Rock, Hot Springs and Fort Smith.

T. Ed Bryan, of the Tampa, Fla., Automobile Club, and A. J. Yeager, of the Juniata Valley Motor Club, Lewistown, Pa., were elected directors.

Chairman Evans indicated that the activities of the touring information board had outgrown its present headquarters, and at his suggestion the president was authorized to appoint a committee to formulate plans for conducting the work of the board on a broader scale and arranging for larger headquarters in the near future.

Chairman Terry, of the committee on resolutions presented the resolutions in appreciation of the association for the long-continued interest and splendid service rendered by its former president, William H. Hotchkiss. The appointment by Chairman Hower of T. A. Wright, of Wilkes-Barre, Pa., and S. B. Stevens, of Rome, N. Y., as members of the contest board was approved.

A meeting of the national convention committee followed the directors' meeting and it was unanimously decided to hold the second annual good roads convention in the city of Cleveland during the last week of September. It was announced that George C. Diehl, of Buffalo, chairman of this committee, and Secretary F. H. Elliott will shortly visit Cleveland, and while there confer with the officers of the Ohio State Automobile Association and the Cleveland Automobile Club relative to the naming of committees to take charge of the local work and make other arrangements for the holding of the annual good roads convention.

It was decided to hold the next meeting of the A. A. A. executive committee in Detroit on Saturday, July 10, and upon the invitation of President Speare the directors will be invited to attend this meeting. The association's officers will be guests at the banquet to be given on that evening by the motor car manufacturers of Detroit and will be guests at the Automobile Club of Detroit on Sunday and witness the start of the Glidden tour on the 12th.

NEW YORK ORPHANS ENJOY GOOD TIME IN DREAMLAND

WHAT FOREIGN CAR FACTORIES ARE DOING

BRUSSELS, June 4—Some time ago the Motor Age correspondent mailed letters to all the leading Belgian motor car manufacturers, also to a few of the leading concerns in other countries of the world, asking for data concerning the history of the concerns. It probably would astonish the majority of even the smallest concerns in America to read some of the replies. Some of these old country manufacturers must have thought that here was a nervy sort of a fellow, who was trying to get all the secrets he could concerning the car builders of the old world. A Belgian firm, established already some 10 years, wrote partly as follows: "The information you ask us to give you is of a strictly confidential nature, and if you think that we are so stupid as to make it known how many cars we built the first year we were in business and how many we produce this year, also how many men we employed then and how many we now have, then we believe you are either deliberately seeking trade secrets or else that you are a newspaper man of little experience."

Information Refused

Another Belgian concern said in part as follows: "We do not intend to furnish the data you desire for the benefit of either American or any other motor car manufacturers. We think the information you want has no interest at all for the ordinary reader of your magazine but that it would be of interest only to rivals." One of the leading Belgian concerns, while furnishing some of the desired data, refused to quote the selling prices of its chassis. "We prefer not to publish the price of our chassis," wrote this concern, "so that they might not conflict with the prices quoted by our agents in foreign countries. Our foreign agents have expenses greater than our Belgian agents." The day after this manufacturer's letter was received, all the desired information was secured by the Motor Age man through another channel.

In replying to the writer's letter quite a number of the manufacturers specified in their answers that it was well understood that the information furnished at the request of the Motor Age correspondent was not to be charged for. One Italian concern wrote that only upon receipt of a letter stating that there would be no charge made would the desired data be furnished. The requested letter was mailed and in return the data received was found to be entirely incomplete and unusable. Here are some of the important trade secrets thus obtained from a few leading Belgian and other continental car makers:

The Societe Anonyme des Ateliers Germain, of Monceau-sur-Sambre, Belgium, was organized in 1874, but started the construction of motor cars only in 1897. In that year 100 men were employed in the motor car department and the year's production amounted to thirty chassis. This year the concern's schedule is for 400 chassis to be finished by the 450 workingmen. The principal business of the Germain house is making railway and street cars, motors and engines for various kinds of tractions and for power boats, and all kinds of other material made of iron, steel and other metals.

La Societe de l'Auto-Metallurgique, of Marchienne-au-Pont, Belgium, was founded in 1872, and ever since has been one of the leading national concerns making railroad and street car material, such as cars, wheels, etc. Ten years ago the first motor cars were made by this concern, there being about 100 men employed in the motor car department, which produced some twenty-five cars the first year. This year all told 800 men are employed throughout the entire plant and from 600 to 700 chassis will be completed.

Les Usines de Saventhem, located in Saventhem, near Brussels, make the Belgica motor cars. Engaged in the general iron and steel business for many years, this concern started in the motor car business in 1903, when its sixty workmen completed forty chassis. This year there are 310 men employed by the Saventhem people and their production of 1909 chassis will number 175

The Compagnie Belge de Construction d'Automobiles Pipe, more commonly known as the Usines Pipe, is located in Brussels, and make the Pipe cars. This is one of the very few concerns in this country which is devoting itself entirely to the construction of motor cars, motors for cars and motor boats, and since about a year also engines for flying machines. The concern was organized in 1898 with a force of fifteen men. Three chassis were finished the first year. In 1909 from 300 to 350 men are employed and the output will be of 300 chassis.

Big Belgian Concern

Les Usines Nagant Freres, or the Nagant brothers' plants, are located in Liege, Belgium. This firm was established in 1860 and has been one of the best known in the country for its guns and other weapons. In 1899 the first motor car chassis were turned out, the year's output being thirty-five chassis by the fifty-five men employed in the plant. This year the concern employs all told 350 men and will make 225 chassis. It was this concern which made for a while the Belgium Gobron-Brillie cars and later the Belgian Rochet-Schneider cars. In recent years the Nagant cars only have been made by the Nagant brothers.

Les Usines Dasse, of Verviers, Belgium, make the Dasse cars. Founded in 1885 the concern placed its first motor cars on the market about 6 or 7 years ago. The exact date is not furnished, but the firm states that it employed twenty men the first year and that they completed two cars. This year the forty men are expected to make twenty chassis.

Les Usines Minerva, better known now as the Minerva Motors Co., of Berchem, near Antwerp, was started in 1896 under the name of S. de Jong & Cie. The Minerva bicycles were made and later on the Minerva motor cycles. From a very small beginning the house of Minerva grew rapidly to be the largest motor cycle manufacturing concern in Belgium. In 1901 the study of the motor cars was started and in 1903 the first Minerva motor cars were placed on the market. In 1896 about fifty men were employed and at present more than 1,100 are to be found in the immense plants of the company. Information about the number of cars constructed was not furnished, but it was stated that the value of the motor cycle and car and motor business is now close to $1,200,000 per year.

The Fif cars are made in Brussels by the Compagnie des Automobiles Fif, which was organized in 1908. The company claims to employ at present 250 men and to intend to turn out 300 chassis this year.

Doing Big Business

La Fabrique Nationale d'Armes de Guerre, of Herstal, near Liege, was organized in 1890, and has ever since been making guns and other weapons and bicycles. A few years ago the first F. N. motor cycles were constructed and in 1905 the first F. N. motor cars. The concern, which now employs all told from 3,000 to 3,500 men, says that it turned out 300 chassis in 1905 and that it will build 600 chassis this year.

The Neue Automobil Gesellschaft, of Berlin, Germany, which makes the N. A. G. motor cars, was organized in 1901 and employed about 150 men that year. Its first year's output numbered forty vehicles of all kinds, such as pleasure cars and commercial cars. In 1906 the concern employed 1,200 men and built 600 cars. This year the working force has been reduced to 800 and arrangements were made to build 450 motor cars, besides a large quantity of marine and airship motors, stationary engines and electromobiles.

The Etablissements Sizaire-et-Naudin, of Paris, started in the motor car business in 1904 with fifteen men in the shops. Thirty cars were made that year. In 1909 the shop's working force numbers 220 men and the output will be 550 cars.

The Renault Freres concern, of Billancourt, near Paris, started to make Renault cars in 1898 with six men, who completed six cars or chassis the first year. In 1909 at the beginning of the year there were 2,606 men on the payroll and the concern has laid out a schedule for making 4,600 Renault cars.

RUSH TO GET IN FRENCH VOITURETTE RACE

PARIS, June 4—Twenty-three small cars will start in the voiturette race at Boulogne-sur-Mer on Sunday, June 20, the only pure speed contest to be held in France this year. For a long time it looked as if the solitary race was doomed to failure, for the entries stood at six for several weeks, and it was only during the last 3 days preceding the final closing that the number was run up to twenty-three. France, England, Belgium and Spain are the countries represented, the first named having the majority of entries, the others being content with one team each.

Unlike previous voiturette races in France, one-lunger racers will not be in the majority this year. Lion-Peugeot, whose recent successes at Barcelona and in Sicily have made them the favorites for the Boulogne race, will present two single-cylinder cars and one twin-cylinder. The one-lungers are special productions with a bore of 3.9 inches and a stroke of 10 inches; as on all the special racing cars they will have enormous valve area, but instead of a single inlet and exhaust, which is apt to give trouble by reason of warping, there will be three of each, operated by an original type of rocker arm. The two-cylinder car has a bore of 3.1 inches and a stroke of 7.8 inches. Although this car has won the two previous races of the year, it is slightly inferior in speed to the one-lungers from the same factory, its victory in Sicily having been due to its companion running out of gasoline, and at Barcelona to the breaking of the road wheels of both its team mates. All three cars develop about 35 horsepower, and can easily maintain a speed of 60 miles an hour on the straightaway.

Thomas, the ex-motor cyclist, will handle a Le Gui voiturette with a single-cylinder de Dion motor of 3.9 by 10 inches bore and stroke. Maurice Fournier, younger brother of the better known Henry Fournier, will take the wheel of a Werner fitted with an engine similar to that of the Le Gui. Three Crespelle cars, newcomers to the racing game, will have practically the same power plant. The French firm Alcyon will this year put its faith in four-cylinder cars, having the minimum bore of 2½ inches, and the maximum stroke of 5½ inches. The chief driver is Barriaux, an old voiturette hand, with a couple of team mates yet to be chosen. Renault-Schneider, a St. Etienne firm, is an entirely newcomer and intends to make its debut on the race track with commercial models of 2.7 by 4 inches bore, which have obviously little chance of winning first prize.

England is represented for the first time in a French voiturette race with three Calthorpe four-cylinder cars of 2½ inches bore by 5 1/10 inches stroke. The engine has its cylinders in a single casting, Hele-Shaw clutch, sliding gear transmission, and final drive by cardan shaft. One of the interesting features is the use of Rudge-Whitworth demountable wheels, very largely employed on the other side of the channel but not previously demonstrated on the continent. Spain sends a full team of four-cylinder cars with engine dimensions 2½ by 5½ bore and stroke. The drivers are Zuccarelli, for a long time Lancia's mechanic; Derny, an ex-Clement champion who figured in Paris-Madrid and Paris-Vienna; and Pilliverdie, a newcomer to the game. Belgium has forwarded the engagement of three cars known as the Rif. The firm is recently established and nothing has yet been made known regarding the car.

The race will be run on a very varied course having grades up to 13 per cent and measuring 23 3/10 miles round. Ten rounds will be covered without controls.

TOURING IN EUROPE

Paris, June 4—The rush of American motoring tourists to Europe has this year commenced much earlier than usual, and to judge from present indications will be a record one. The tendency of the last 2 years for motorists to bring over their own cars is more pronounced than ever, and there doubtless will be few leading American firms that will not be represented by touring parties this summer. The Packard still holds the lead as the American car most generally employed for foreign touring. H. D. Wilson, the European representative of the company declares that at the end of May he had been in touch with fifty-seven different parties touring Europe in Packard cars, this being a remarkable number when it is considered that the touring season is not supposed to begin until the middle of June. The number, of course, does not include all Packard cars running through Europe, for many of the tourists having no need of either spares or touring information do not report at headquarters. Among those having reported during the past month are two directors of the company: Russell Alger, who has just purchased a Wright aeroplane, and Phillip McMillan; Truman H. Newbury, ex-secretary of the navy; Charles M. Schwab; Thomas Nelson Page, the author; A. S. Carhart, of Tuxedo, and Edgerton Winthrop. The Pierce agent, N. F. Goodsill, also reports an increased number of visitors to the company's touring bureau in the Avenue de la Grande Armee, Paris. A third American firm to establish an American depot for spare parts and touring information is the Peerless Motor Car Co., whose Paris depot is located at the new American garage in the Rue du Mont Thabor, in the center of the hotel district, in charge of Manager Bousquet. Among the other firms not possessing European offices, but whose cars have been reported in the city garages during the past few weeks, are White steamer, Locomobile, Thomas and Rambler.

E. R. Thomas, maker of the Thomas, is one of the European tourists. He has just made a trip over the Simplon pass, crossing the Alps from Italy to Switzerland and describes it as follows:

"The trip was considered very remarkable. The pass was barely opened, and on account of the snow was regarded as impassable for motor cars for a month or so. Everyone advised us, including motorists familiar with the country, hotel keepers, etc., as is usually done at this season of the year, to ship the car through the tunnel, and, in fact, we had arranged to do so, but when we arrived at the foot of the mountain the scenery looked so grand we could not resist the temptation as we so much wished to cross the mountains under our own power and visit the hospice of St. Bernard and see the famous St. Bernard dogs that are famous throughout the world for rescuing people lost in the snow; and so, instead of taking the train, we started off about 2 p. m. instead of in the morning as is usual later in the season.

"I will not attempt to describe the scenery except to say that we were awed with its grandeur. The highest peak is over 13,000 feet. We ascended about 9,000 feet. The road was in splendid condition except near the top, where it was covered with snow, and except on very short turns and at dangerous points we made the entire ascent on high gear, notwithstanding the car was a limousine, loaded with five passengers and their luggage.

"If anyone ever had doubts about the flexibility and the everlasting pull on high gear of a six-cylinder motor a trip over the Simplon pass will efface them forever. The regulations limit the time through the pass to 3 hours, but we had to lay up an hour to avoid being fined. I do not know the grade, but the ascent was very steep. Through the tunnel it is only 12¼ miles, but across the pass by road it is about 39 miles. The snow for quite a distance was above the top of the limousine, and the cut was so narrow it brushed the lamps at the side of the limousine. As we were on the edge of a precipice at this point we were more interested in getting over the road and hence did not stop for a picture.

"At the St. Bernard hospice we were greeted too affectionately by a drove of St. Bernard dogs, backed up by a kindly priest who offered refreshments. Among the many interesting features of the hospice was a fine portrait of Napoleon the First, presented by himself, also of many of the older popes. Napoleon the First established the hospice, also seven refuges en route.

"Our success excited much interest at the various hotels, and the performance attracted many visitors to the car, which is probably the largest that ever crossed Simplon pass."

Legal Lights and Side Lights

BLOW AT SPEED TRAPS

THERE is rejoicing among the Illinois motorists on the result of the tidings from Springfield Saturday that Governor Deneen had affixed his signature to the patented lamp bill as passed during the strenuous closing hours of the last legislative session. This bill is regarded as a decisive blow at the speed traps which have intermittently flourished at various points, inasmuch as it permits a court in inquiring into an alleged violation of the speed statutes to ascertain whether, considering traffic conditions at the time, the speed at which the motorist was traveling was actually excessive. Heretofore in order to convict an alleged violator of the law, it was only necessary to prove, for example, that the motorist was traveling at a rate of 16 miles an hour in a 15-mile district. The fact that the street was deserted, a clear view of the road ahead possible, and that there were no intersecting streets had no weight whatever. The motorists were particularly jubilant that a session which for months threatened to produce some of the most hostile legislation the state has ever known should finally go on record as favoring what is regarded as a most advanced speed provision.

The amendment which produced this result was tacked to an amendment designed to specify the conditions under which tail lights and numbers should be carried. On the last Friday of the session the senate passed the bill in its amended form, and at 5 o'clock on the troublous final Sunday morning the house concurred in the senate amendment. Sidney S. Gorham, legal counsel of the Chicago Automobile Club, who has represented the club at Springfield during several past sessions, is given the credit for producing an outcome so gratifying in its possibilities as a destroyer of speed traps.

"Under the law as it has stood heretofore," Mr. Gorham explains, "if an officer testifies that a motorist has driven 17 miles an hour in a 15-mile district, the court must either impose a fine or in effect indicate that he does not believe the testimony of the officer. As the law is amended, the court may inquire into the surrounding facts and circumstances as to intersecting streets, whether the view was obstructed and the conditions of traffic, and if the court finds that under all conditions involved the rate of speed was not faster than was reasonable, the alleged offender may be discharged without the necessity of rebuking the officer except to say that the arrest was unnecessary. It has been found in the past that men arrested in speed traps have usually been driving at a reasonable rate of speed. In some cases we have had evidence strongly indicating that the motorist was not going at as high a rate of speed as the officer testified to. It was an extremely difficult matter, however, to combat his testimony, inasmuch as he could swear that he had held a stopwatch over a measured stretch. As to general traffic conditions on the road there will be little opportunity for a discrepancy in the testimony of witnesses. Municipal Court Judges Himes, Newcomer, Beitler and Goodenow chanced to be in Springfield when the measure was passed and they unqualifiedly endorsed it."

Mr. Gorham cited the experiences of the Chicago Automobile Club in combating what were regarded as instances of undue activity on the part of constables at Glencoe and at Niles last summer.

"The new law will give a motorist an opportunity," he said, "if he is one of the unfortunates who has been apprehended when driving at a perfectly sane rate of speed, to appeal from the decision of the court, and then, when the case is given its second hearing before an impartial tribunal, to show so clearly that the car was being driven at a speed reasonable under the conditions as to result in his discharge. Such arrests would speedily become so unprofitable that the speed traps would go out of existence."

The provision of the new law is that "no person shall drive a motor vehicle or a motor bicycle faster than is reasonable and proper, having regard to the traffic and the use of the road, or so as to endanger the life or limb or injure the property of any person." The law also increases the penalties for violation of the statute, and requires that numbers on the rear of cars shall be fixed in a stationary position and that the tail light shall shine upon them.

Another bill signed by the governor was one making the registration annual instead of perpetual as has been the case in the past. Hereafter Illinois motorists will have to pay $2 yearly.

PAGE BILL IS PASSED

The Wisconsin legislature has passed the Page bill, but amendments adopted at the last minute ruined the intent of the bill as desired by the combined clubs and associations of Wisconsin in eliminating the speed limit and making reckless driving under the circumstances a misdemeanor. The assembly amendment places a speed limit of 18 miles in cities and 25 miles in the country districts into the bill. The senate passed the bill as drawn, but in the assembly the rural members expressed the opinion that there was a joker somewhere in the elimination of the speed limit. The new speed limits are an improvement over the old provisions, which were: In cities, 12 miles, and country districts, 18 miles. The clubs are taking the compromise with good grace, as the opposition developing in the assembly was not unexpected. The Page bill also provides that no person under 16 years of age may operate a machine unless accompanied by a parent or guardian, and makes parties who fail to stop and offer assistance to any person injured guilty of a misdemeanor. It also raises the license or registration fee from $1 and $2 and abolishes transfers.

The city of Beloit, Wis., has adopted an ordinance prohibiting all persons under 18 years of age from driving machines within the city limits. The ordinance does not interfere with the new law prohibiting persons under 16 years of age, unless accompanied by parent or guardian, from driving.

Alderman Irving H. Tarrant, of Milwaukee, Wis., is advocating a tax on all kinds of vehicles and conveyances, excepting baby carriages. He says that Milwaukee is becoming so large that new methods of revenue must be provided, and if motor cars are taxed, other vehicles should be.

WILL HELP MACDONALD

If a bill which passed the house of the Connecticut state legislature goes through the senate and becomes a law, James H. MacDonald, the state highway commissioner, will have increased powers. This was the second appearance of the bill in the house. A feature of the measure is that it gives the commissioner the power of appointing a deputy commissioner and eight engineers, their compensation being left to him as well. Under this bill the state stands the expense of trunk line construction, doubles the appropriation for repairs—that is, from $25,000 to $50,000 a year—and makes it possible for the commissioner to go into any town and force repairs. Provision is also made for an increased expenditure for the operation of stone crushers from $2,500 to $5,000 a year. The restrictions placed upon trunk line money appropriated for 2 years are removed so that it will be possible for the commissioner to use all the money in 1 year if he deems it expedient. For the salaries of the commissioner and his assistants, $65,000 is provided. The bill was finally passed though many attempts were made by the opposition to defer definite action on the measure. If this bill becomes a law, Connecticut will be well equipped for the construction and maintenance of good roads.

WILL MAKE TEST CASE

The Automobile Club of Pittsburg and the Wilkinsburg Automobile Club will next week institute test cases in the Allegheny county court to try to straighten

out complications which have arisen under the new Pennsylvania motor law passed at the winter session of the state legislature. Attorney E. J. Kent will handle the case for the Pittsburg club. The contention of the club is that all sections of the act in force prior to the passage of the motor law are repealed by the new law, with the exception of that portion of the former law relating to the collection of state licenses. This much of the old law is in force, say the members of the club, because at the time the new law was passed the state already had begun to collect licenses for this year, and persons who had paid their license fees before the passage of the new law would be forced to take out a new license. If the contention of the club is sustained, it is possible that more test cases will grow out of the attempts of owners to force the city to refund to them money which they had paid for city licenses before the passage of the new act.

The Wilkinsburg club will start a test case growing out of the alleged violation of the speed law by Gordon Montgomery, one of its members. The contention of the club, which has determined to use this sentence as the basis for a test case, is that the requirements of the law have not been fulfilled by the borough officials, inasmuch as no danger signs were posted warning the motorist to reduce his speed. The officials of a majority of the boroughs, they say, have neglected to comply with the requirements of the law and have posted no signs, yet they persist in arresting and fining motorists who are obeying the law strictly, although they may be traveling in excess of the 12 miles an hour. In some boroughs, also, it is alleged, signs are posted, but the lettering is not 5 inches in height, as required, nor is the sign in a position where it may be seen easily by the driver of the car as he passes the spot. Often, the claim is made, the lettering is imperfect and difficult to read.

MOTORIST WINS HIS POINT

W. W. Scranton, the Scranton, Pa., millionaire, who last summer became involved in a lawsuit with the Laurel Run Turnpike Co. because he insisted on using the road despite the objections of a gatekeeper, who wielded an ax on the car's wheels to enforce his argument, has finally won out, the supreme court handing down a decision compelling the owners of the road to open it to motorists. When the lower court decided in favor of Mr. Scranton, the turnpike company carried the case up to the supreme court, its contention being that the road was too narrow and dangerous for a motor car.

BATTLE ON IN BAY STATE

"Not a yip was heard," is the way one of the state house reporters expressed himself on the manner in which the motor bill went through the lower branch of the Massachusetts legislature last week. In the place where it was expected that there would be some sort of a fight there was no opposition. When it gets to the senate it will be the same story. And naturally the men interested in the motor industry in Boston and other cities are sore. But they have awakened from their lethargy and now there is going to be some real fighting in the Bay state. Plans are now under way to plunge boldly into politics. The issue has been put up to the motorists and they have accepted it. Facts and figures were given to the committee and the members were told that it was up to them to decide whether to keep the industry out of politics or not. The members of the legislature have seen fit to haul it in body and bones.

There is going to be no half-way measures either in retaliation. The issue is going to be made a party one and the republicans must stand for it. Governor Draper recommended it to the legislature in his inaugural and the legislature followed his instructions, assisted by the highway commission, and now Massachusetts is in the same class as New Jersey. So the plan is to go out and fight next fall in the towns where are located factories affiliated with the industry. The republican party is very strong in Massachusetts in presidential years, but Governor Draper is not a strong candidate. This is his first year and he is now about in the same position ex-Governor Bates was in a few years ago when a democratic governor was swept into office.

Labor interests were given an awful jolt by the legislature. Then there was forced down the throats of the people of Boston a charter bill on which they will have nothing to say. Mayor Hibbard, of Boston, is very unpopular and he has put the party in bad in that city, so that this fall there will be an awful slump of republicanism there. Police Commissioner O'Meara has not helped very much, either, with his frequent arrests of motorists and teamsters. He is a clean, able man, but he hews right up to the line and it is this that hurts. Then there was a beef scandal when Governor Draper took the part of the officials upholding infected beef until the papers fought so hard there came a change. On top of this was a land scandal in connection with one of the state commissions that was squelched by the committee handling the matter. So the motor industry issue is going to be tacked onto these. It came very near being brought into the last campaign, but at the last minute was dropped because it was supposed that fair play would be given the motorists. The plan under way now embraces securing the name of every man who works in any factory affiliated with the motor industry, every man who works in a garage, real estate men, chauffeurs, etc., and it is expected that there will be some 25,000 names secured. These men will be told what happened this year, how the bill was held up until the last minute and slid through unfairly. They will be given the names of the candidates who voted for the bill. Already tabulations are being made of the votes last year to learn where there were close contests for nominations and election. If any of the present members of the legislature run again and they are in districts where there are motor plants or places affiliated with it, speakers are going into the districts and throw on the light. Men who are making their first campaign will be asked what assurances they will give to see that motorists get a fair show before they get any support. So from now on the battle is going to be waged steadily, as only by this means can anything be secured. The men behind the motor industry have waited too long.

WASHINGTON IS WORRIED

Motorists in Washington, D. C., are havorder has been issued from police heading a good deal to contend with lately. An quarters to arrest every motorist whose car drips oil on the street. Many arrests resulted and some motorists are in a quandary, as they do not know how to keep their cars from dripping oil. The latest edict from the city fathers is that the odor, smoke and noise of motor cars in Washington must be reduced to a minimum. Engineer Commissioner Judson has recommended to his colleagues on the board of commissioners that "the superintendent of police be instructed to give consideration to the matter of the desirability of police regulations having to do with motor vehicles, with a view to accomplishing the following results: The reduction of offensive emissions of smoke, with attendant odors, the prevention of unnecessary and disagreeable noises that result from permitting the exhaust to escape without being properly muffled; the reduction of danger that results from unshaded and brilliant beams of light in crowded localities."

Commissioner Judson further recommended that the superintendent of police be directed to prepare a tentative draft of such regulations as he may deem advisable, designed to secure the abatement of any or all of the above nuisances. The only thing that is worrying the motorists is that in the event the suggested regulations are put into force, they will be so rigidly enforced as to work a hardship to many motorists.

NEW WISCONSIN MEASURES

The new Wisconsin law prohibiting joy riding and placing a penalty thereon reads as follows: "Any person who shall operate any motor car, motor cycle or similar motor vehicle upon any public highway of this state without the consent of the owner of such motor vehicle, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not exceeding $50 or by imprisonment not exceeding 30 days, or by both such fine and imprisonment in the discretion of the court."

The Readers' Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

FRICTION-DRIVE EXPERIENCE

BURNS, KAN.—Editor Motor Age—In Motor Age, issue May 27, the experience of those who have used friction-driven cars was asked. I have used a friction-driven Orient for 3 years and so far it has given perfect satisfaction. I have had to replace the paper wheel but once and the friction plate has no grooves in it yet. The drive never slips even on the steepest hills or in mud. I believe the friction drive is the ideal system for transmitting power in light cars; however, I think it would not be practical on a heavy machine. Will high-test gasoline increase the power of a motor? The usual test is between 60 and 64. Would gasoline testing 72 to 80 make too rich a mixture, thus overheating the motor?—Lloyd K. White.

High-test gasoline is generally used because it affords easier starting, in that it volatalizes more readily. In using it there should be no trouble due to overheating unless you are feeding too much, which can be regulated solely by the needle valve.

TIGHTENING ROLLER BEARING

Salem, Ia.—Editor Motor Age—Will Motor Age give me the best method for tightening a roller bearing which has worked loose in the gearbox, without removing the bearing from the box? I have one that is not tight, it having a play of about ¼ inch. Also state how to insert a ball in a roller bearing without removing the bearing from the box.—Herbert Shriner.

It is impossible to suggest a method of adjusting this bearing without knowing the name of the gearbox in which it is used. One manufacturer using roller bearings in his gearbox employs one method of adjustment, whereas another manufacturer uses a different method. If you will give the name of the manufacturer of the gearbox it will be possible to give explicit directions. Every bearing of this nature has an adjustment provided, and it is quite possible to take up the amount of play you mention. In all probability the trouble is not due to wear, but to the adjustment getting wrong. It is not possible to substitute ball for roller bearings unless the short-series roller bearings are used, which are made interchangeable with annular ball bearings.

KNOCK FROM WEAK MIXTURE

Brooklyn, N. Y.—Editor Motor Age—Replying to K. K. Keith, Eagle Grove, Ia., in the Readers' Clearing House, issue May 20, and also to A. B. Gardner, issue June 3, I wish to confirm the conclusions that they have arrived at. A too weak mixture on a hill will invariably cause a knock and by a rich mixture, a knock that is heard, in most cases will be eliminated. However, Mr. Gardner's reasoning strikes me as being fallacious. It is not the heat that causes the knocking, but the knock is usually caused by too premature an ignition. When the needle valve to the carbureter is opened, thereby giving a rich mixture, the same effect is accomplished as if the spark is retarded, as the mixture being very rich, burns slowly enough to allow the piston to begin the third cycle motion or the propelling motion, before it explodes. It seems strange that this point should not have been discussed before, as I, personally, for the past 10 years, have read in the various journals a warning not to have too rich a mixture, as it will cause knocking.—The Tinker.

OMAHA CLUB'S ROAD SIGN

Omaha, Neb.—Editor Motor Age—In Motor Age, issue May 13, appeared an article regarding road signs put up by the Omaha Automobile Club, wherein it was stated that the signs are in the shape of an arrow. We wish to correct this statement, as these signs are in the form of our motor car emblem, which embodies the letters composing the name of the club. We send herewith a rough sketch showing the form of the signs and would be pleased if Motor Age would correct the statement previously made, as we are quite proud of the use we have made of our emblem in this connection.—Omaha Automobile Club, W. R. McKeen, Jr., president.

HAS A GRABBING CLUTCH

Santa Barbara, Cal.—Editor Motor Age—I have a model T Ford car which, though generally satisfactory, has the disagreeable feature of starting with a jerk owing to the grabbing of the low-speed clutch. The low, reverse and transmission brake bands are immersed in oil and as this oil is pressed out they all grab. The bands are fiber lined. Would not some other material work better? How about leather or cork inserts for this purpose?—R. L. Bond.

OMAHA CLUB ROAD SIGN

The best method of remedying this grabbing, or jerking at starting, is to remove the fiber-lined bands forming the low-speed clutch, and take the fiber off the band and dress it down, giving it an even surface, after which it may be replaced. The grabbing is solely due to unevennesses that form in the fiber and cannot be remedied other than by a dressing process as referred to. It is no doubt possible to use other friction linings for this clutch. It would be impossible to use leather with cork inserts without having new clutch bands in which would be recesses to receive the cork inserts.

CALCULATING HORSEPOWER

Chase, Kan.—Editor Motor Age—In almost every issue of any of the publications devoted to the interests of motor cars, there is a discussion of the long vs. short stroke, and the A. L. A. M. rating. The average explanations are rather obscure to a layman and I am going to propound a question, the explanation of which would make a part of the subject more plain, at least, to myself. There are gasoline engines with piston strokes of say from 4 to 10 inches, and we will assume a cylinder diameter of 4 inches. Presuming that the compression in each of the above engines are the same—let us say 70 pounds—what would be the initial pressure on the piston at the moment of explosion, and what would be the pressure at end of the stroke of each? With the A. L. A. M. rating these engines would show the same power, but it seems that among the best informed, the 10-inch stroke is admitted the more powerful. Where does its increased power come from and what is the difference in horsepower of each?—Fred L. Willard.

The reason of the greater horsepower coming from a motor with 4-inch bore and 10-inch stroke than from a motor with 4-inch bore and 4-inch stroke, is that the one with the 10-inch stroke draws in exactly two and one-half times the volume of gas each suction stroke of each piston. A 4 by 4-inch motor has a total piston displacement of 202 cubic inches, this representing the volume of gas drawn in from the carbureter for four explosion strokes, that is one explosion in each cylinder, which would represent two revolutions of the crankshaft. The piston displacement of a 4 by 10-inch motor is 505 cubic inches for the same cycle of operation. The amount of horsepower varies directly

with the volume of gas exploded, and the heat units liberated thereby, which are transmuted into mechanical energy. It is apparent, then, that a motor with 505 cubic inches of gas to be exploded, each two revolutions, will give more than the one with 202 cubic inches.

In calculating horsepower it has been customary to use a formula which takes into consideration only the cylinder diameter. This was used and has been used because the length of stroke was rarely in excess of the diameter, but with the advent of long strokes, which are more than twice the diameter, the weakness of the formula appears. The initial explosion pressure varies at the time the spark takes place, but generally ranges from three to four times the cold compression, so that with a motor of 70 pounds of cold compression there might be 300 pounds of ignition compression per square inch. The pressure at the end of the stroke is nothing; in fact, the majority of manufacturers open the exhaust valves from 15 to 40 degrees before the end of the explosion stroke, it being an acknowledged fact that the strength of the explosion is entirely spent in the first 120 degrees of the stroke. It is fair to assume, however, that with a 10-inch stroke and the greater volume of gases the power impulse will continue longer with the piston than with a short stroke, in which the volume of exploded gases is much less. It is customary, also, in motors with long strokes to use a higher compression than those in which the bore and stroke are practically the same. If long strokes continue to be manufactured, it will necessitate using a horsepower formula in which the length of the stroke is a factor.

MANY QUESTIONS ASKED

Ough, Neb.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions: 1—Are motor-car steam cross compound engines ever equipped with a valve called the intercepting valve—on northwest traction engines—for automatically letting live steam into low-pressure cylinder when needed to cause it to do the same amount of work as the high-pressure cylinder? 2—Please give rule and explanation for determining the pressure at the end of the stroke for different cutoffs at any boiler pressure, also the average or mean pressure for the entire stroke. 3—Would one of the second-hand steam engines for motor cars, such as the Mason, Locke or Locomobile, that can be purchased for from $5 to $20, be satisfactory with a flash or semi-flash generator? 4—If I properly understand the pumps of a steam motor car, they correspond to a cross-head pump on a traction engine, that is, they run when the engine does whether water is needed by the boiler or not. Would it not be a saving of friction, wear, and fuel, to use independent steam pumps that would run only when, and as fast as would be necessary to pump the required amount of water? Are there any cars or generators equipped thus? 5—Please explain why a longer wheelbase tends to easier riding? Does this apply to the entire car or to only a part of it, and if so which part? Are the motor cars and motor buggies set or aligned like buggy and wagon wheels, that is with gather and plumb spokes? If so would it not cause the side chains and sprockets to be out of alignment, causing undue friction, wear, and strain? 6—I recently asked, "What is meant by single-acting and double-acting motor car engines." I referred to steam engines. Motor Age published this question April 15, but did not answer it. 7—What is the highest steam pressure that gives good service and no trouble about packing on engines using packing? How does superheat effect the engines and packing? 8—Would wheels for a motor buggy of 40, 44 or 48 inches diameter ride any easier or require any less power than 36-inch wheels? 9—In Motor Age, issue April 15, under "Motor Car Literature" the National Tube Co. was mentioned but its address was not given. Please give same. 10—Is Shelby tubing suitable for steam and what pressure will it stand? 11—Would a car pull any better if the drive wheels were in front, and could it be steered by the rear wheels?—Sanford E. Frazell.

1—The motors of steam cars such as the White have an arrangement whereby high pressure steam can be admitted direct to the low-pressure cylinder as well as to the high pressure one, which is done when a particularly heavy pull for a short distance is needed. 2—Motor Age would suggest consultation with steam engineers on this question. 3—Such motors, provided they are in good condition, could be used with flash or semi-flash boilers. 4—The water pumps work when the motor is running. Motor Age does not know of any steam plant fitted with the type of pump of which you speak would operate only when water is needed; the demands on the water are so varied and sensitive that it would be practically impossible to get pumps to operate in this way. 5—A car with a long wheelbase rides easier than one with a short wheelbase because there is a period between the time the front wheels strike an obstruction and when the rear wheels strike, one for the springs to bring the body to its normal state of equilibrium; whereas, with the short wheelbase car traveling at any speed this is practically impossible. In a short wheelbase car the rough riding is occasioned by the rear axle which, of course, is transmitted through the car. In some cars the rear wheels are cambered and in which the sprockets between drives have a slight camber which is entirely compensated for by the chain. 6—A single acting steam engine is one in which steam bears on one side of the piston only, whereas, in a double acting the force of the steam is used in pushing the piston first in one direction and then back again. 7—Steam pressure of 600 pounds to the square inch is used without trouble to the packing. More efficient lubrication is needed with superheated steam. 8—Wheels 40, 44 and 48 inches in diameter will ride easier on a motor buggy than 36-inch sizes, and will not require any more power to drive provided the gear ratio is changed according to the circumference of the wheel. 9—The address of the National Tube Co. is Pittsburg, Pa. 10—Shelby tubing is suitable for steam work and the pressures it will stand can be secured by writing the company. 11—Undoubtedly front-wheel drive produces more power than rear-wheel drive, but it would be impossible to steer by the rear wheels. It is the combination of driving and steering through the front wheels that has given trouble with front-wheel drive.

TOURING INFORMATION WANTED

Madison, Wis.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give me the best route between Madison, Wis., and Nashville, Tenn., also distance. Is it best to cross the Ohio river at Evansville, Ind.? What are the road conditions from Evansville to Nashville? I would like suggestions from readers as to the best route.—C Bontly.

As far as Motor Age can discover your best route from Madison, Wis., to Nashville, Tenn., would be by way of Chicago, South Bend, Indianapolis, Louisville and Nashville. From Chicago to South Bend is 101 miles over macadam road. From South Bend to Indianapolis is 148 miles over good roads with little sand. The exact road directions from Indianapolis to Louisville are not in the possession of Motor Age. From Louisville to Nashville is 219 miles, going by way of Mount Washington, New Haven, Buffalo, Magnolia, Canmar, Uno, Bearwallow, Cave City, Bowling Green, Franklin, Whitehouse and Goodlettsville. Motor Age has not any route information by way of Evansville, or information on the road conditions between Evansville and Nashville.

DURYEA ON WEAK MIXTURE

Reading, Pa.—Editor Motor Age—A. B. Gardner's communication in Motor Age, issue June 3, about weak mixture is misleading. A weak mixture is one that has insufficient fuel for proper power. Such a mixture is slow burning and will not produce a knock. The mixture which will knock the quickest is the one of proper proportions for complete combustion or slightly fatter than this. Increase the proportion of fuel and the mixture will burn every bit of air and so give a little more power. Increase further, and the burning becomes slower and knocking ceases. But the mixture is then too fat and this is the thought I wish to bring out. The greatest

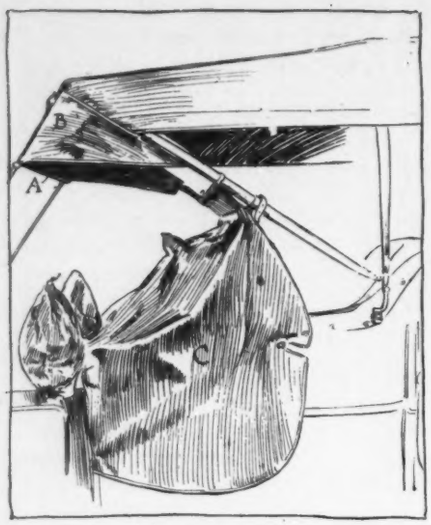


FIG. 1—DODGE'S STORM CURTAIN

heat and power are derived from mixtures that are wasteful of fuel; the greatest efficiency—economy—from mixtures that contain plenty of air to burn all the fuel. And such a mixture is to be considered as a proper one and not too lean or weak, as Mr. Gardner stated. The difference in power between the mixture of maximum power and maximum economy is not great, while the freedom from odor, the quick response to spark and throttle and similar advantages all warrant advocating the economic mixture.—Charles E. Duryea.

TIRE PROBLEMS ANSWERED

Georgetown, Ky.—Editor Motor Age—Will Motor Age tell me if 36 by 4-inch tires are large enough for a car weighing 3,200 pounds, fully equipped without passenger load. What pressure should 36 by 4-inch tires have when not heated by running? I find that running 20 or 35 miles per hour will increase the pressure in my tires from 8 to 10 pounds. Is there any tire manufacturer who makes a 4½-inch tire to fit a 36 by 4-inch rim? Does Motor Age think it economy to have blowouts repaired on second-hand tires?—E. B. S.

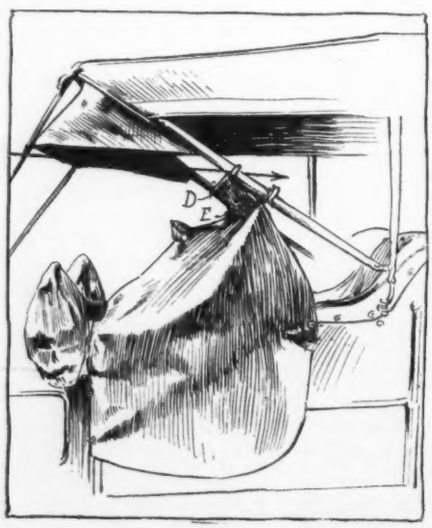
A 36 by 4-inch tire should safely carrv a load of 850 pounds per wheel, and should be inflated to 75 pounds for front wheels and 85 pounds for rear wheels. Now, 850 pounds per wheel with four wheels should carry 3,400 pounds. Figuring this way your tires would seem to be sufficiently large; but, owing to the fact that the weight is seldom found to be equally distributed on front and rear wheels alike, it would be well to weigh your car in the following manner: Using a platform scale, first weigh the entire car; then weigh one end with the middle of the car over one edge of the platform. Next weigh the other end in the same way. If this has been carefully done, the last two weights taken, when added together, should give within 20 pounds of the total weight of the car. The car should be weighed with all seats occupied, tanks full, and, in short, loaded to its maximum. None of the prominent manufacturers make a 4½-inch tire to fit a 36 by 4-inch rim. As to the economy of having blowouts repaired on second-hand tires, all depends upon the general condition of the tires and the nature of the injury.

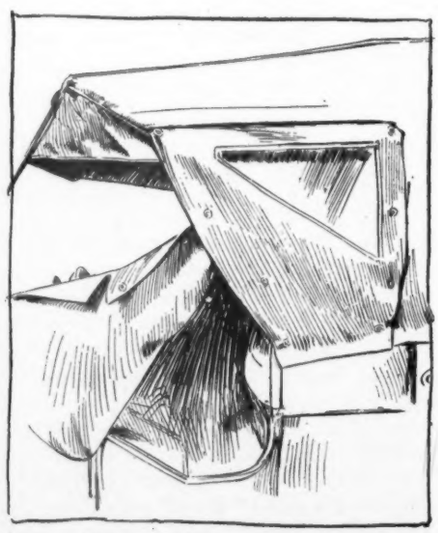
INGENIOUS STORM CURTAIN

Nicetown, Philadelphia, Pa.—Editor Motor Age—I enclose blue prints showing arrangement of curtains which I have had made for my motor car, an arrangement which possibly has sufficient novelty to make it a desirable thing to illustrate in Motor Age. I am not a manufacturer or dealer, and have no desire to make any profit out of the curtains, but simply think the idea might be entertaining to others who have suffered from either glass or celluloid fronts to their machines at times when the protection is needed the most on account of rain or snow. With the arrangement of curtains as shown in Figs. 1, 2, 3 and 4 I am able to go through the heaviest kind of showers regardless of the force of the wind and keep comfortable and dry, and at the same time have a perfect view of the road and surroundings, which is so desirable and so conducive to safety. The little brow B, Fig. 1, attached to the straps which hold the top in place has a batten A about the size of a lath in its lower edge, and when not needed the side extensions are folded in, and the little curtain rolled up on the batten and held in place by two straps encircling it and buttoned on the outside of the top. The large curtain or boot C, Fig. 1, is arranged so that the steering wheel extends into a bag, or extension on the curtain, the side flaps go down far enough to protect the seat of the machine and the footboard, but the interesting novelty of this boot consists in having two battens D and E, Fig. 2, about 5 inches apart on the upper edge and straps attached to the curtain or boot at the ends of the batten by which the boot is fastened to the front bow of the cover. You will observe that by using these two battens the upper portion of the boot inclines forward at about right angles with the main body of the boot, or curtain. This effectually prevents any of the rainwater that would be dashed or splashed against the lower part of the boot being carried upward over the surface by the wind and coming over the edge and hitting the chauffeur in the face. While running into a high wind and holding a handkerchief on the upper edge of the batten, the current of air blows the handkerchief vertical for about 5 inches and then by a gentle curve is deflected toward the top of the canopy; in other words, there is no direct breeze blowing in the face of the chauffeur. You will note that the lower edge of the brow B and the upper edge of the boot C are almost on a level with each other. I find that even a driving rain blowing toward us hits the boot at about the position of the steering wheel. So far as the observation is concerned, the chauffeur can see to the vanishing point of a level road; by leaning forward slightly can see his lamps on the dashboard, and has a good side view.

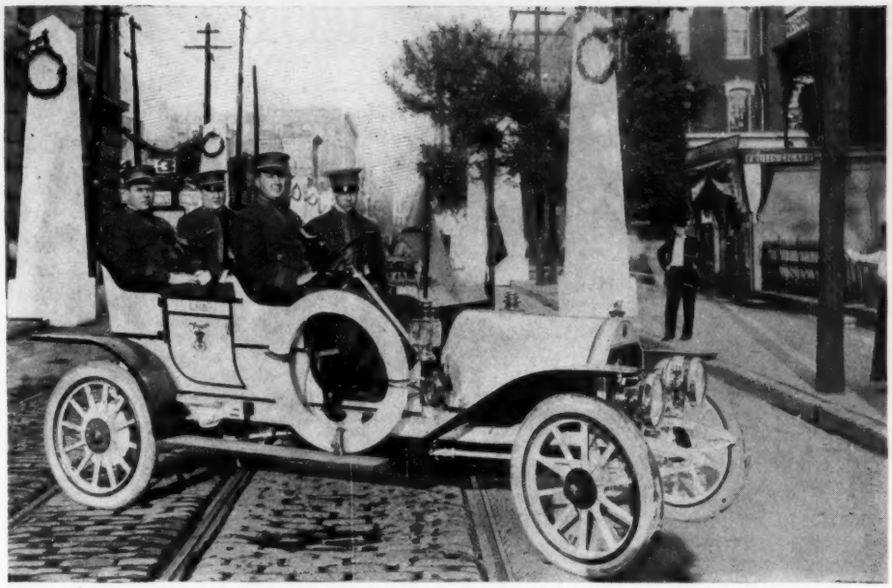
The boot C or large curtain has its flaps folded in and is rolled up on the two battens, making a roll about 3 feet 6 inches long by 3½ inches in diameter. This we carry secured to the rear bow of the canopy and close against the rear curtain. My three straps are fastened to the rear bow going around the boot when rolled up and attached to the top of the bow with the ordinary swiveling fastenings. So much for this feature.

The other illustrations will show an arrangement which I have found very convenient for carrying all of the side curtains on my machine which are ordinarily placed under the rear seat. You will observe Fig. 4 shows the roll of curtains R strapped up and supported by the curved shelf S shown in Fig. 4. This shelf is supported by two angle brackets D which rest on the floor, but are not fastened thereto, being simply held in place by the cocoa mat M as shown in Fig. 4.





FIGS. 2 AND 3—DODGE'S UNIQUE STORM CURTAIN



SPECIAL PREMIER CAR USED BY SHRINERS

The general advantage of this whole arrangement is that in the event of a shower coming up, the chauffeur can easily enclose the car without disturbing any of the passengers. Incidentally considerable room is gained for the storage of other things besides curtains and these are much better preserved in this rolled-up condition than if folded and placed in the space beneath the seats, where, if there were any play whatever, they would dance around and chafe so as to do themselves considerable damage; whereas rolled up as I show in these photos, they are very much better preserved.

I might call your attention to the location for a clock which is indicated by the arrow H, Fig. 4, and a small opening at X which is hardly discernible, but which I could not show better, enabling the passengers in the tonneau to see a speedometer so that they are as well informed so far as speed and time is concerned as though they were sitting in the front seat.

Fig. 3 shows a feature which is of some interest. The flap of the boot which is being held up, when lowered down can be secured on the outside of the front curtain so that the chauffeur, after he gets in or the party sitting alongside of him, can securely fasten the boot after he is in. This is something that cannot be done with the curtains that are furnished with the car. The machine shown, I suppose you will recognize as a Packard.—James M. Dodge.

SHRINERS HAVE SPECIAL CAR

Louisville, Ky.—Editor Motor Age—One of the interesting features of the interesting meeting of the Mystic Shrine here was the sending of a special car by the Premier Motor Mfg. Co., and of which car I furnish an illustration herewith. Members of the different temples who attended enjoyed many interesting tours around the city as Premier guests. The car was in white enamel and decorated with shrine colors. Those shown in the cars are all members of Al Malaikah temple, Los Angeles, Cal. This, I believe, is the first time the motor car has been sent to a convention in this way.—J. B. Ormand.

A RUNAWAY MOTOR CAR

Hartford, Conn.—Editor Motor Age—Dr. J. E. Root, of Hartford, Conn., left his motor car standing in front of a patient's house while he went to make a call. The car was facing downhill. When he came out his car was missing and he immediately reported his loss to the police. Soon after he was informed that a car was standing about 1 mile away in a rather dilapidated condition. Upon investigation it was found to be the doctor's. He had left his car with the gears engaged at intermediate speed by stopping the engine. Left alone, the car began to coast down grade and the gears being in had started the motor by compression, a thing which almost every motorist has done to avoid cranking. Running by itself it had descended a long hill, passed one of the principal streets, up a bank, across an open lot and down another 10-foot bank, swung into an adjacent street, hugging the curb, tearing to pieces the tires, but still running until it struck a telegraph pole, which it tried to climb.—Christine F. Glen.

WANTS MOTOR INFORMATION

Tarrytown, N. Y.—Editor Motor Age—The Manufacturer's Communication in Motor Age, issue June 10, page 31, by Mr. Palmer interested me very much, and I wish he would kindly give his opinion on the following method of cylinder design: Given a 4-inch bore and 6-inch stroke and a compression of 75 pounds, making the combustion chamber to give this result, what would be the cubic contents of this cylinder to give this result. The form of the combustion chamber to be ellipsoidal with valves in the head. What horsepower would a four-cylinder motor of these dimensions be rated to give, the speed to be all that is practical to get from this size? Or given an ellipsoidal combustion chamber with valves in the head, the cubic contents of which is 25 cubic inches, at 75 pounds pressure, and 4-inch bore, what would be the length of stroke? My idea is that the volume or quantity contained in the combustion chamber at a practical working pressure—say 75 pounds—is a good factor to use as a base in designing a motor. Say that we want to use 25 cubic inches of explosive material at 75 pounds pressure for every explosion, and to design a motor to do this in the most satisfactory manner, the bore can be decided on and the stroke made to give the desired result; or the stroke decided on and the bore made to give the result. It is understood that the revolutions per minute of these motors would always be governed by a practical number of feet of piston travel per minute. The long-stroke motor would have the advantage of greater leverage due to the longer throw of the crankshaft, and the disadvantage of the friction due to the greater number of feet of piston travel—that is, if both the long and short stroke motor made the same number of revolutions per minute. The basic idea of this method is that the volume or quantity of explosive material will be used to the best advantage in a form of cylinder designed to use that exact quantity. The work done by 10 cubic inches of any explosive will not be equal to the work done by 20 cubic inches of the same kind of explosive under the same conditions.—M. A. J.

WEAK MIXTURE AND BACK-FIRING

Lafayette, Ind.—Editor Motor Age—In Motor Age, issue June 3, I noticed the trouble of back firing that "A Subscriber" from Cincinnati, O., has. I experienced identically the same trouble and found it due to a very weak mixture, and not to improper seating of the intake valves at all. The trouble entirely disappeared when I got perfect adjustment of the needle valve in the carbureter.—Subscriber.

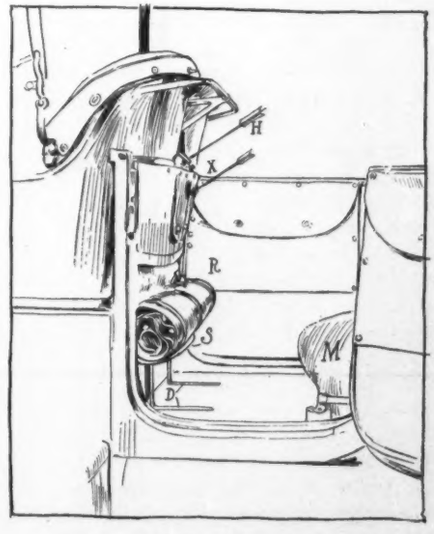


FIG. 4—DODGE'S STORM CURTAIN

ELECTRICAL DEVICES USED IN MOTOR CARS

By Thomas J. Fay
Part IX

ZINC even in its purest state as used in battery work will not afford perfectly uniform results unless it is amalgamated. On open circuit, when the zinc is not amalgamated, the metal used is not so pure that it will lie in the solution in a quiescent state. The amount of local action that will take place even on open circuit will depend upon: the impurities in the zinc, the texture of the same, the degree of concentration of the electrolyte, and the difference in density of the electrolyte at different points over the surface of the zinc.

By electrolyte is meant the solution or, as it is called in primary battery work, especially of the gravity genera, the excitant. At all events, every battery is made up of three prime parts—the positive element, the negative element and the electrolyte or excitant. Some batteries have separate containing jars and other parts as covers and separators, but the prime members are as given, subject to such modifications as will be introduced in the discussion of the several types of batteries used in motor car work.

Due to the uneven gravity of the electrolyte in cells, local action will follow since the electro-motive force of any battery as a whole is a variable depending upon the specific gravity of the electrolyte. If the electro-motive force of a battery as a whole is altered by changing the strength of the electrolyte, as indicated by its specific gravity, it is an assurance of difference of electro-motive force between adjacent zones in any given element. This difference in density of the electrolyte is a very serious matter and it is a question if any type of battery is entirely immune from it.

Impurities In Zinc Cells

In zinc batteries, or in the types of battery using zinc as one of the elements, the ills of impurities are done away with to a vast extent by the process of amalgamation, so that this form of battery trouble is very readily disposed of. When the zinc is impure, as it is in commercial work the impurities consisting for the most part of iron, arsenic, etc., induce local action. When the metal is submerged in an electrolyte, because of the difference of potential due to dissimilar metals, a current will flow, the strength of which will be governed by the resistance in ohms of the local circuit. This local action, then, is precisely the same as the action of a cell of battery, and the result is a nest of little cells of battery, as it were, formed out of the metal of the plate, on the one hand, and the impurities in the metal, on the other. The extent of damage that will be done to a cell will depend upon the nature of the impurities and percentage present in the metal of which the plate is made. When the process of amalgamation is resorted to, which process is possible if zinc is used as the element; mercury is used, and when it is spread over the surfaces of the zinc it has the property of isolating the zinc from the particles of iron and other impurities, so that local action is aborted. This process takes into account the fact that the mercury clings to the zinc in such a way as to exclude the electrolyte from between the zinc and the mercury, and the result is that there is no battery action between these two dissimilar metals because they are in intimate relation with each other, that is, short circuited.

Preventing of Local Action

In the process of amalgamation the zincs are cleaned as thoroughly as possible, and the mercury is then rubbed into the pores of the zinc, all over the surfaces. The mercury does not in any way prevent the zinc from serving its intended purpose in the battery, and it is extremely fortunate that mercury has the property of intimate contact with the zinc, displacing the particles of iron or other impurities and isolating them so that they cannot be the cause of local action. This is no license to use inferior zinc in battery work, for like all good things there are limitations beyond which it is not wise to go.

In dry batteries it is just as important to observe the rule of purity of the elements and it is also desirable to so mix the excitants that they will be of equal strength all over the surfaces of the elements that go to compose the cell. The mere fact that the electrolyte of the cell is absorbed in plaster of Paris is no bar to the ills of impurities or differences in density of the excitants. In the cells that cannot be subjected to the amalgamating process, it is even more important to select pure metals for the elements and the electrolyte should be up to a fitting standard.

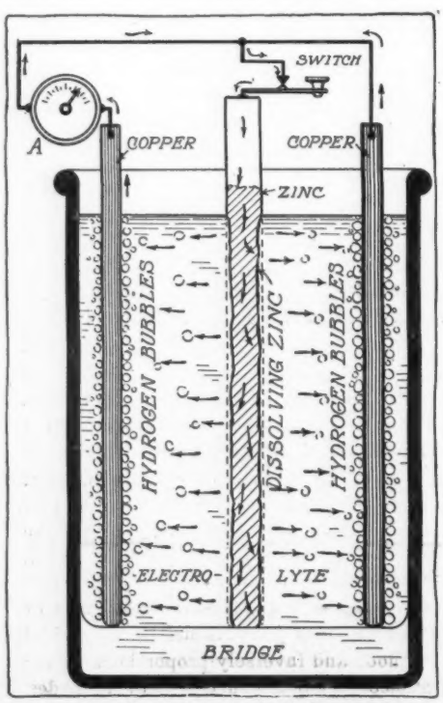


FIG. 27—SECTION OF A ZINC-COPPER CELL

Potential Difference of Dissimilar Metals

Anode	Cathode	Excitant	Depolarizer	Voltage*
Zinc	Copper	H_2SO_4	None	1.00
"	"	$ZnSO_4$	$CuSO_4$	1.07
"	Carbon	H_2SO_4	None	1.00
"	"	"	K_2CrO_7	2.10
"	"	"	HNO_3	1.90
"	"	NH_4Cl	MnO_2	1.40
"	"	KOH	CuO	.8
"	"	$ZnCl_2$	Cl	2.0
"	"	$ZnSO_4$	Hg_2SO_4	1.4
"	Mercury	"	"	1.43
"	"	$ZnCl_2$	Hg_2Cl_2	1.
In Accumulators—Secondary Batteries				
Lead	Lead	H_2SO_4	PbO_2	2.2

*The voltage given is the maximum.

This table is by no means complete, but it will be all that is necessary to illustrate the points to be made and enough to serve for such battery work as the average motorist will have to dabble in. What the table indicates is that the elements, as cited, if they are combined in the manner as stated using the excitants given will afford the maximum voltage affixed to the respective columns, provided the method of adaptation is efficient. Let it be understood that this voltage as a potential difference will be more or less present, if the elements exist as impurities in a cell and the result will be in a diminished output of the same besides a shortened life.

Likewise other impurities will have more or less the same result, so that it is of the greatest importance to avoid the presence of undesirable elements and compounds in the cells, and when batteries are made it is equally desirable to so combine the materials as to afford, as nearly as possible, the theoretical, maximum, potential difference between the elements, the values of which are given in the table. The table, then, is equally good from two points of view: It gives the maximum expectation due to the proper combining of the different metals, when they are immersed in the electrolyte, and it serves as a key to the damage that will follow if some of the elements are present as impurities in batteries.

Value of Depolarizers

If depolarizers are not present the action will be retarded on account of the high resistance of the envelope of hydrogen, coupled with the counter electro-motive force engendered, insofar as the output of a cell is concerned. From the viewpoint of local action the absence of depolarizers will make very little difference, due to the relatively low rate of discharge, and the large surface over which the hydrogen bubbles will be enabled to spread, thus rendering the performance of hydrogen impotent from the

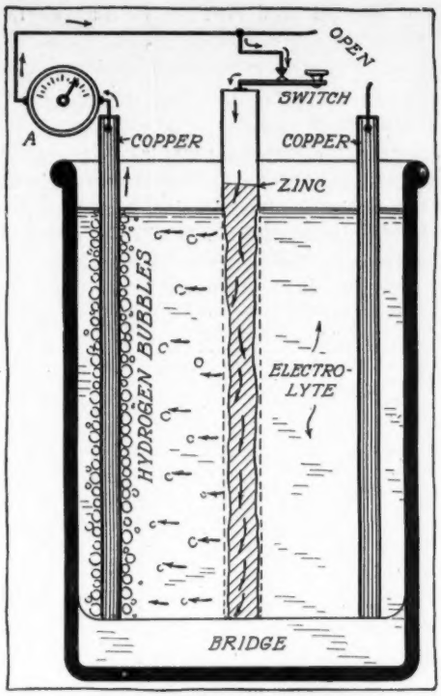


FIG. 28—ZINC-COPPER CELL

point of view of a local action reducer, although this same hydrogen does limit the output of a cell in which it is allowed to collect at the cathode. Depolarizers are good in that they afford a larger rate of discharge of a battery than would be possible in the absence of them, but they are of no value when it comes to preserving batteries from local action if the latter is due to impurities. If an improperly-designed and constructed battery will perform but poorly, due to impurities in the materials used, the same result will follow if impurities are added by the user of the same. To best appreciate how to maintain a battery in actual service, it is but necessary to ascertain the reasons why a certain practice is followed in designing and building the same.

To this point the aim has been to discuss the subject in a manner to bring into view such batteries as are generally well understood by motorists and to afford certain practical information as an incident. It has been the purpose as well to depart from certain of the descriptive practices, rather with the expectation of supplementing them and at the same time say all that would seem to be necessary. In view of the importance of the storage battery and the extent to which it is destined to serve in motor car work, rather than to risk having it receive scant attention at the hands of the reader, it is proposed to reserve it to the last, and to introduce other matter such as electro-chemistry in the meantime, thus aiding the reader to understand the subject broadly before discussing the storage battery.

Electro-Chemistry In Batteries

It was shown in connection with the zinc-copper cell how polarization may be aborted by taking advantage of the process calling into play the phenomenon involved in electro-chemistry. Take, for illustration, Fig. 27, showing a cell made of glass or other suitable material, in which is placed an anode of zinc, and a pair of plates in the cathode relation made of copper, and the whole immersed in diluted sulphuric acid, H_2SO_4, the density of which should be about 1.25 specific gravity. When the circuit is closed by the switch the zinc dissolves in the acid, and the acid gives up its hydrogen as indicated by streams of bubbles. The bubbles collect around the copper plates, with the effect as previously stated, and it is a noteworthy fact that the bubbles of hydrogen are evolved at the copper plate rather than in the electrolyte or at the zinc plate. If carbon is substituted for the copper the hydrogen bubbles will form around the same, rather than at the zinc, thus showing that carbon and copper are in the same relation to the zinc, differing only in degrees.

When the circuit is at first closed if the ammeter A is observed it will show that the current will be very considerable, but as the bubbles of hydrogen increase around the copper plate the current in amperes will decrease, and after a time the current will reduce almost to zero. This is a good illustration of what has been said that the hydrogen bubbles around the cathode of the cell increase the resistance of the cell, but they do more, in that the presence of hydrogen is attended with a counter electro-motive force. This is an indication of the absence of a depolarizer in this case and such a cell would be of little or no service for the reason that the current would not be constant.

If, as shown in Fig. 28, one of the copper plates is disconnected, the hydrogen bubbles will not then form around this plate, and it can be shown that the plate is rendered inactive, assuming that it is chemically pure. The remaining plate will be surrounded by hydrogen bubbles, as indicated, and the voltage of the cell will be the same as if the first plate were not disconnected at all. In the case, as depicted in Fig. 28, the zinc will not dissolve in the electrolyte so rapidly as before, which is an indication of some change, even though the voltage is not reduced by the reduction in the number of plates in actual electrical relation. What really happens is that the potential difference is that of zinc and copper, no matter how many or how few plates there may be in the cell, but the current in amperes will reduce as the cell increases in resistance, which it does if the number of plates is reduced. When the external circuit of a plate is interrupted it is equal to the complete removal of the plate from the cell since it will become and remain inactive. In a general way it is possible to say of a cell of battery that the ampere capacity of the same is directly proportional to the area of the anode and inversely proportional to the distance between anodes and cathodes. This is but another way of saying that the output of a battery is directly proportional to its internal resistance, all other things remaining constant.

Observations of Batteries

By thus showing one of the plates on open circuit, in the manner shown in Fig. 28, the points made may be summed up as follows:

Hydrogen will form at the cathode of any cell that is not provided with a depolarizer; if the external circuit of any plate is opened, the plate will not contribute to the output of the cell; decreasing the distance between anodes and cathodes is equal to increasing the output of a cell, due to the decrease in resistance that will attend the change; increasing the surface of the anode, assuming that every anode surface is in juxtaposition to a cathode surface, will have the effect of increasing the output of the cell; obviously, if the output of a cell is increased by any of the means named, the amount of zinc dissolved will be in direct proportional to the increase in the output; it is plain, then, that dissolving zinc is a sign of low internal resistance if the cell is not in a short-circuited condition as shown in Fig. 29. If the cell is short-circuited, the zinc will dissolve to no good purpose. What is true of the zinc-copper cell is equally true in any cell, no matter of what material it is made or how.

Short-Circuiting Cells

Referring to Fig. 29, notice may be taken of the presence of some metallic substance as a nail wedged in between the plates on one side, and as might be inferred the plate so interfered with would fail to deliver any current to the external circuit, although there would be a violent local discharge, and the accumulation of hydrogen bubbles to show that the zinc is dissolving to no good purpose. Inciden-

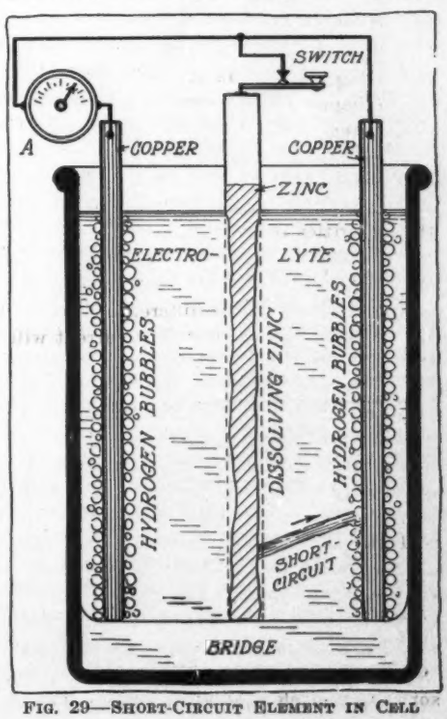


FIG. 29—SHORT-CIRCUIT ELEMENT IN CELL

tally a short circuit due to iron would contaminate the cell and the ills that follow the presence of iron in a cell would soon be rendered manifest. This is a matter that will be of the greatest importance in connection with storage batteries and it will be of advantage to sprinkle a little attic salt over this phase of the question while the opportunity affords. This is frequently done in practice.

The final result of a short circuit is to render the cell dead, in which state it will do no work, moreover, it will be beyond recovery. When a cell is active and in good working order there are divers ways of arriving at the amount of work it will do and the cost of doing the same. In electro-chemistry, it is the aim to deal with these problems and there is a fair degree of precision attached to the art.

Process of Electrolysis

In electrolytic work the elements are called electrodes, the compound to be decomposed electrolytes and the process electrolysis. In this process the product of decomposition is called ions. There is a very definite relation between batteries and electrolytic work and it is much easier to understand batteries when the electrolytic process is well in hand. It was Faraday who gave to the world the nomenclature of the art and Lord Rayleigh established the constants which are used and accepted as correct. According to accepted authority, a current of 1 ampere will deposit .017253 grain, or .001118 gram of silver per second on one of the plates of a silver volt meter. The liquid employed was silver nitrate in solution, holding from 15 to 20 per cent of the salt. This was an extremely important discovery and the constant thus afforded is of the greatest value in commercial work. Similarly, the weight of hydrogen set free was found to be .00001044 gram per second, considering 1 ampere of current per second. With this information available it is possible to determine the amount of any substance that will be liberated in the electrolytic process, thus rendering it easy and safe to enter a prediction as to the competence of the several materials suggested for use in electrolytic work, and with a little ingenuity it is possible to arrive at conclusions in relation to batteries as well.

With the hydrogen constant available, if the chemical equivalents of the constituents of other substances, such as may be used, are ascertained the weight of constituents set free may be arrived at. It has been found, for illustration, that the current in amperes that will liberate 1 gram of hydrogen will liberate 7.94 grams of oxygen. The ratio of hydrogen to oxygen, therefore, is as 1 to 7.94, and the ratio of hydrogen to silver is as 1 to 107.11; these values represent the chemical equivalent of oxygen and silver respectively.

Chemical Equivalent of Elements

The chemical equivalent of any element may be found in the manner as here follows:

$$\text{Chemical equivalent} = \frac{\text{Automatic weight}}{\text{Valency}}$$

The electro-chemical equivalent of elements may be found in the manner as follows:

Electro-chemical equivalent = .00001044 × chemical equivalent.

When .00001044 = electro-chemical equivalent of hydrogen.

Although it is true that comparatively few of the elements are present in batteries, it is, nevertheless, desirable to keep before the mind's eye a wide range of the elements, on the count that improvements are ever being made; and in the long run it is better to have in hand a list of all the elements from which it is easy enough to refer to such of them as may be involved in a given case. The table as follows of the elements and symbols, with atomic weights, will be of advantage in many ways.

Atomic Weight of Elements

Characteristics of elements and table of international atomic weights, as reported by the international committee on atomic weights for 1905:

Elements and Symbols	O=16	H=1
Aluminum, Al	27.1	26.9
Argon, A	39.9	39.6
Antimony, Sb	120.2	119.3
Arsenic, As	75.0	74.4
Barium, Ba	137.4	136.4
Bismuth, Bi	208.5	206.9
Boron, B	11.0	10.9
Bromine, Br	79.96	79.36
Cadmium, Cd	112.4	111.6
Caesium, Cs	139.2	131.2
Calcium, Ca	40.1	39.7
Carbon, C	12.0	11.91
Cerium, Ce	140.25	139.2
Chlorine, Cl	35.45	35.18
Chromium, Cr	52.1	51.7
Cobalt, Co	59.0	58.55
Columbium, Cb	94.0	93.3
Copper, Cu	63.6	63.1
Erbium, Er	166.0	164.8
Flourine, F	19.0	18.9
Gadolinium, Gd	156.0	154.8
Gallium, Ga	70.0	69.5
Germanium, Ge	72.5	72.0
Glucinum, Gl	9.1	9.03
Gold, Au	197.2	195.7
Helium, He	4.0	4.0
Hydrogen, H	1.008	1.0
Indium, In	115.0	114.1
Iodine, I	126.97	126.01
Iridium, Lr	193.0	191.5
Iron, Fe	55.9	55.5
Krypton, Kr	81.8	81.2
Lanthanum, La	138.9	137.9
Lead, Pb	206.9	205.35
Lithium, Li	7.03	6.98
Mangensium, Mg	24.36	24.18
Mercury, Hg	200.0	198.5
Molybdenum, Mo	96.0	95.3
Neodymium, Nd	143.6	142.5
Neon, Ne	20.0	19.9
Nickel, Ni	58.7	58.3
Nitrogen, N	14.04	13.93
Osmium, Os	191.0	189.6
Oxygen, O	16.0	15.88
Palladium, Pd	106.5	105.7
Phosphorous, P	31.0	30.77
Platinum, Pt	194.8	193.3
Potassium, K	39.15	38.85
Praseodymium, Pr	140.5	139.4
Radium, Ra	225.0	223.3
Rhodium, Rh	103.0	102.2
Rubidium, Rb	85.5	84.9
Ruthenium, Ru	101.7	100.9
Samarium, Sm	150.3	149.2
Scansium, Sc	44.1	43.8
Selenium, Se	79.2	78.6
Silicon, Si	28.4	28.2
Silver, Ag	107.93	107.11
Sodium, Na	23.05	22.88
Strontium, Sr	87.6	86.94
Sulphur, S	32.06	31.82
Tantalum, Ta	183.0	181 6
Tellurium, Te	127.6	126.6
Terbium, Tb	160.0	158.8
Thallium, Tl	204.1	202.6
Thorium, Th	232.5	230.8
Thulium, Tm	171.0	169.7
Tin, Sn	119.0	118.1
Titanium, Ti	48.1	47.7
Tungsten, W	184.0	182.6
Uranium, U	238.5	236.7
Vanadium, V	51.2	50.8
Xenon, Xe	128.0	127.0
Ytterbium, Yb	173.0	171.7
Yttrium, Yt	89.0	88.3
Zinc, Zn	65.4	64.9
Zirconium, Zr	90.6.	89.9

Of all the elements as above given, but few of them were thus far called into play in battery work, but the storage battery situation will develop further inroads on the list, and as before stated, the number of elements available for the purpose is increasing all the time.

(To be continued.)

OVERLAND COMPANY PLANS

Toledo, O., June 5—As a result of the bringing to Toledo of the Overland company, the plant of the Kinsey Mfg. Co., of Dayton, O., will be removed to this city, which will mean the employing of 500 men and the bringing to Toledo of 100 new families from Dayton, O. Formal announcement of the removal of this plant to Toledo was given out a few days ago by Mr. Willys, who also stated that a $50,000 three-story addition would be made on the old Pope plant. Said Mr. Willys: "I wish to deny the report that D. M. Parry is connected with the Overland company. His wife held some stock, but I purchased this a week ago. He will in no way be connected with our company. I may say without the slightest show of egotism that our coming will be a good thing for Toledo. It will mean the employment of 2,000 men, 1,500 by ourselves and 500 by the Kinsey Mfg. Co., which is leaving Dayton to come here. I am also a stockholder in this company, which manufactures frames, mud guards, hoods, battery boxes, under pans and radiators for cars. We will let the contract in a few days for the building of an addition to our plant here to be occupied by the Dayton concern, which will also use a part of the present building. Our total production next year will be a minimum of 10,000 cars with a probable maximum of 15,000. Half of the number will be made in Indianapolis. Harold L. Pope will be the manager of the Toledo factory. He will begin at once to get rid of the stock and Pope-Toledo cars. We will not manufacture a high-priced machine. Some of the machinery in the Pope plant will be sold and more modern and faster automatic machines will be installed. We have given a contract to the Toledo Machine and Tool Co. for $50,000 worth of new machines."

AS A YANKEE SEES BUSINESS ABROAD

NEW YORK, June 12.—A great overproduction of motor cars in storage, manufacturers literally begging dealers to dispose of their stock, the American cars rapidly cutting into their sales, is in brief, the status of the foreign motor car industry as told by A. E. Schwartz, or Paris, foreign representative of the American Motor Car Manufacturers' Association, who arrived in New York yesterday.

"I am very agreeably surprised to see the enormous difference between the conditions in the trade over here and abroad," said Mr. Schwartz. "Everybody here seems to be as busy and busier than we would dream of on the other side of the ocean. In fact, the conditions over here reported briefly to any European manufacturer or dealer would seem incredulous, and would be marked as a bluff, which is the famous French expression when one tries to impress upon the French maker the magnitude and growth of this wonderful industry in America. But it is not only in the car business that this slowing down is to be signalled. It is the same in the accessory lines.

"Of course a few makers endeavor to keep up their reputation and do a little business in some particular type of car; mostly small cars. But, then, the rest of the manufacturers are simply existing, and where they do each other the most harm is by cutting the price through giving high discounts offered to the private buyer, who, of course, think they can do without the dealer. It is therefore not astonishing to see big signs 'to let' on some of the stores that used to be famously known as motor car centers.

"In some of the stores that are still open, you can see sporting goods such as tennis racquets, boxing gloves, etc., and also bicycles, to help pay the rent. In one of the big stores bicycles are now being manufactured and in another wrenches are being made.

"The reason why this wonderful business has come to almost a standstill in France is partly because of the police, who arrest one as often as they can, for the most trifling offense. If your motor emitted a little bit of smoke, such as any ordinary pipe smoker would leave behind him, this would cause the taking of your name and number—on which occasion the policeman tries his best to find something else against you—and fines you 50 francs. If there was only one bicycle policeman in Paris, conditions would not be so bad; but, unfortunately, there are more, and a driver is liable to be stopped by each, and therefore one can imagine how much a ride costs in Paris with a smoky motor.

"Secondly, there is a taxation on each horsepower and every seat in the car; 5 francs each seat and 5 francs for every horsepower. Now if one buys a 30-horsepower car with four seats, it means 170 francs taxation. One hundred and seventy francs to the city and the same amount to the state, totals 340 francs.

"It would be far too long to cite here all the little things that make motoring disagreeable on the most beautiful laid-out roads, which are kept the year round in wonderful shape, a fact which, of course, is very well known all over the world.

"Another reason for the decrease in car owners is the taxicab. Until April 1, 1909, there were eleven different tariffs in use and it was necessary to study all the different colors and types of taxicabs in order to know how much it would cost you to go a certain distance. Since the first of April these things have changed for the better, and there are only four tariffs now allowed by the police. The cheapest is 33 centimes a kilometer, and you can even hire a cab that will allow four people to travel an hour for 50 cents, which, of course, is a great inducement for everybody to use them, and naturally one reason more for the owner, who only uses his car in the city, to sell his own car and rid himself of all the bother caused to him by the police, the garage people and his chauffeur.

"There are also some big companies that do a livery service with small cars for town use and, of course, all these items help along to diminish the number of private owners."

JOBBERS ORGANIZE

Buffalo, N. Y., June 11—The Motor Jobbers' Accessories Association, Incorporated, was formed here at a meeting today with the idea of bettering trade conditions. The capital stock will be issued to subscribers and will be limited to one share each. The officers elected were: President, Edward A. Loomis, Belcher-Loomis Hardware Co., Providence, R. I.; first vice-president, W. G. Chanslor, Chanslor & Lyon Motor Supply Co., San Francisco, Cal.; second vice-president, C. Kaufmann, Motor Car Equipment Co., New York city; secretary, Daniel Baum, Jr., Baum Iron Co., Omaha, Neb.; treasurer, Charles S. Smith, Charles S. Smith & Co., Philadelphia, Pa. Directors: George Collister, Collister & Sayle, Cleveland, O.; Fred Robie, Excelsior Supply Co., Chicago; D. J. Post, Post & Lester, Hartford, Conn.; Fred I. Willis, Hearsey-Willis Co., Indianapolis, Ind.; J. C. Ralston, Beckley-Ralston Co., Chicago. It is presumed that the next meeting will be held in Detroit at an early date, perhaps just prior to the starting of the Glidden tour. There were present, representatives of the following companies: Wilson Trading Co., New York; Ball-Fintze Co., Newark, O.; Motor Car Equipment Co., New York; Baum Iron Co., Omaha, Neb.; Autolight and Motor Supply Co., Philadelphia; James L. Gibney & Brothers, Philadelphia; Manufacturers' Supplies Co., Philadelphia; Penn Auto Supply Co., Philadelphia; Charles S. Smith & Co., Philadelphia; Belcher-Loomis Hardware Co., Philadelphia; Sidney B. Robie Co., Providence, R. I.; Angier Co., Boston, Mass.; Iroquois Rubber Co., Buffalo; Kelsey Co., Buffalo; Joseph Strauss & Son, Buffalo; Jaynes Automobile Supply Co., Buffalo; Beckley-Ralston Co., Chicago; Excelsior Supply Co., Chicago; Standard Auto Supply Co., Chicago; Collister & Sayle, Cleveland; Penn Rubber and Supply Co., Cleveland; Automobile Equipment Co., Detroit, Mich.; Post & Lester Co., Hartford, Conn.; Hearsey-Willis Co., Indianapolis Ind.; Fred E. Gilbert, Jacksonville, Fla.; Behen-Faught Motor Car Equipment Co., St. Louis, Mo.; Syracuse Rubber Co., Syracuse, N. Y.

RACE TO BE CHARITY AFFAIR

Philadelphia, Pa., June 14—At a meeting of the contest committee of the Quaker City Motor Club last week it was decided to make next October's 200-mile Fairmount park stock chassis race one of the biggest charity affairs ever held in the east. At the suggestion of Secretary Harry Hasbach it was decided to devote the net proceeds from the sale of grand stand seats, and parking spaces to a charity or charities to be later decided upon. Already the prominent society leaders, who will all have reached home from their summer sojournings by the time the race is held, are already taking an interest in the matter, especially as it has been suggested that the resulting funds shall be devoted to furthering the battle against the white plague. Secretary Harbach has given no little thought to the matter, and believes that, properly managed, the race will net from $15,000 to $20,000 to help along the anti-tuberculosis campaign. While admission to the course in Fairmount park would be free, he would station collectors in little booths at all the entrances and the voluntary contributions from this source alone he believes would go a long way toward making up the amount mentioned. Two young scions of Quaker City society—John Wanamaker, Jr., and William Oliver—each 18 years old and the owner of a car of his own, endeavored to settle a dispute as to the speed of their cars by pulling off an ante-breakfast race over the Fairmount park course last Friday morning. The park guards in some manner were put wise to the unscheduled contest, and were on hand to put a stop to the fun. The youthful drivers were stopped on the second round, much to their surprise. Wanamaker had a comfortable lead at the time, due to Oliver having met with tire trouble on the West river drive. A fine of $10 and costs, each, settled the affair, and the fathers were notified to keep their progeny in bounds in future.

The Realm of the Commercial Car

FIG. 1—TRACKLESS TROLLEY SYSTEM IN AUSTRIA

IT rarely happens that any new European invention comes readily to the attention of the public in America before it has been taken up by one of three or four countries, such as England, France, Germany and Italy. This is particularly true of the trackless trolley movement which, for a number of years has been slowly developed in Europe. Early accounts of trackless trolley movements are associated with Germany, but the country to make the greatest progress in the system is Austria, the capital city of Vienna, or Wein as the Austrians spell it, being the biggest center of this movement. Of late the corporation of Salford, Eng., has applied for parliamentary power to construct an electric tramway and operate buses, carriages, or other forms of cars without the customary steel rails. The great objection to the trolley with a metal track for the cars to run on, is the disfigurement of the streets in the quiet, sequestered European cities where property owners have homes that have been in the possession of the family for centuries. The local pride is very strong and trolley companies have great difficulty in securing franchises or permission to lay tracks. With the trackless trolley the street surfaces remain actually as they exist for horse traffic and the only disfigurement is the overhead wires for conducting the current to the trackless trolley car and again forming circuit back to the power plant.

The great talking-point in favor of the trackless trolley is the lighter weight of vehicle that can be used, it being only necessary to carry an electric motor on the car, as do the electric trolley cars of today. This simplifies construction greatly and relieves the car from the task of carrying a heavy storage battery.

The Trackless Trolley

The leading exponent of the trackless trolley in Europe is the Mercedes-Stoll system, which is the invention of Ludwig Stoll, an engineer, who took it to the Mercedes motor car factory where the system was developed to its present state of perfection. Fig. 1 illustrates, in general form, the system, showing as it does the two overhead wires running side by side—one charged with current from the power plant, and the other back to the power plant completing the circuit. In the ordinary trolley car running on metal rails, the return circuit is completed through the ground, but this is impossible with the trackless trolley. Instead of a pole from the top of the car to the overhead wire with a pulley bearing on the wire, the trackless trolley uses a cable which attaches at its upper end to a four-wheeled collector which rides on the two wires. Suspended from the center of this collector is a ball or pendulum which serves to hold the collector on the wire. The cable from the collector to the car for conducting the electricity has a heavy loop adjacent to the ball which is taken up when the car moves to one side or another of the overhead wires, this loop being sufficient to allow the car to turn out when passing vehicles on the road. This loop does not give sufficient latitude, however, and an additional system, shown in Fig. 2, is used. In this illustration only the chassis of the bus is shown, and at the right is a standard S which supports the cable C, this cable passing through a pulley near the base of the standard S and winding upon a spring-controlled drum D on the chassis. When the car moves to one side of the road, as illustrated in Figs 1 or 3, the cable unwinds if necessary, thereby actually permitting the car to be 45 feet to either side of the overhead cable. This flexibility meets every condition necessary in ordinary road use, and makes the trackless trolley a feasible proposition in streets of practically any width. When only two overhead wires are used, as illustrated in Fig. 1, when trackless trolley cars passing in the opposite direction meet, it is necessary before passing to exchange the collectors which ride on the overhead wires. This is made possible by a socket fastening in the cable just above the car body, and in actual practice this exchange can be accomplished in 10 seconds. Because of this it is customary in the majority of cases to use but two overhead wires, and in several Austrian centers these wires are not suspended over the middle of the street, but close to one side, so that practically no disfigurement of the street is caused. The current collector which runs on the overhead wires consists of a frame having two small grooved wheels on each side of it, the positive overhead wire supporting one of these pair of wheels, and the other pair running on the negative wire. As the cable to the car is suspended from the center of the collector frame, the same point to which the pendulum is attached, there is no trouble in keeping the collector on the wires. It is further claimed there is little or no sparking in that the

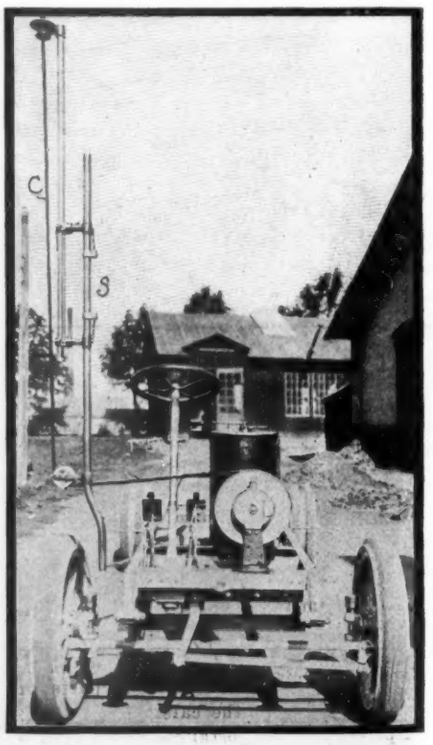


FIG. 2—MERCEDES-STOLL TRACKLESS TROLLEY

FIG. 4—TRACKLESS TROLLEYS RUNNING IN VIENNA

collector wheels run on ball bearings. The flexibility of the cable allows the car to turn completely around on the road with the utmost facility.

Pressed steel is used on the chassis of the vehicles which weigh about 3,740 pounds. The brakes act on the back wheels and there are two motors provided which form a part of the driving wheels themselves. The motors are of 20 horsepower each and are mounted on the driving wheels on the Lohner-Porsche system so that there are no mechanical parts required for control of transmission with their accompanying losses. It is stated that very little lubrication is required as all parts of the motors and wheels run on ball bearings. The cable transmitting the current passes through the axle and the armature of the motor is fixed on the axle itself by means of keys. The remainder of the wheel is mounted on ball bearings as an ordinary motor and entirely enclosed and protected from dust, the cover hermetically sealing the motor as well as serving to fasten it on the axle.

The new Mercedes-Stoll trackless trolley in operation at Vienna in connection with the municipal tramway has just been started, while the Pressburg line with a total length of 3.6 miles in Hungary was ready in May, 1909, with four conductors, one freight wagon and six trackless trolley buses, at a total cost of the line of about 330,000,000 crowns.

This trackless trolley system as well as that at Werdling near Vienna in the Potzleinsdorf-Salmannsdorf district also in operation at Gmund in lower Austria and at Budweis, is the invention of Ludwig Stoll, of Vienna, and among the strong claims made for the system are its simple, rapid, silent and smooth running as well as its freedom from breakdowns and interruptions of service, economy of operation and lightness of the omnibuses used, on account of the motors forming parts of the road wheels of the cars.

A passenger and postal electric trackless trolley service operates between the railway station and the town of Gmund in lower Austria and is under municipal control. The trackless bus operated from 5 a. m. until 10 p. m. makes from thirty to fifty trips per day, and this single car has carried about 45,000 passengers and over a thousand packages, covering a distance of 10,000 miles, without a single repair. It is stated that the motors have been operated for a period of over 16 months without any breakdown or interruption of the service. About 60 miles per day are covered, the electric motors being very commonly overloaded.

Including the lighting of the car and the garage and operating the bus the total consumption of current for the 10,000 miles traveled was 3,030 kilowatt-hours. This is about 304 watt-hours per car-mile and 104 watts per ton-mile on an average.

The trackless trolley line at Gmund has gradients of from 1 to 2 per cent, being slightly hilly the entire length with a maximum grade of 4 per cent for a short distance. The cost of operation is exceedingly low on this line, all of the expenses, including current, for 6 months being less than $600 per car. The cost of maintenance is said to have been $90 oil, grease $5 and current $190; the receipts of the line amounted to somewhat over $1,200, or double the cost of operation for that period.

The Stoll electric trackless trolley road is 2.3 miles long at Weidling, near Vienna, with a steep gradient of 7 per cent, and a very tortuous, hilly line it is. There are five trackless trolley cars or buses in service, each carrying twenty-one passengers. About 100 miles are run daily from 5 o'clock in the morning until midnight. With three cars running, 2,700 passengers are carried without difficulty on Sundays as non-stop runs are possible, only 10 seconds being required for interchanging the trolley cables at the meeting of the cars, this being done at any point on the line.

Solid tires are used on these omnibuses and electric brakes as well as mechanical brakes are provided with pedal as well as hand control. It is maintained that the two 20-horsepower motors on these trackless trolley buses may be overloaded to double their output in emergencies without getting dangerously hot. The cars weigh 2.5 tons each and carry twenty-two passengers, this small weight compared with the load carried being of great importance in relation of road surface wear, rubber tire wear and consumption of current.

The cost of running the trackless cars in Vienna 75 miles each daily is from 7 to 9 cents per mile, the line having a length of 1.3 miles. The current costs for the 75 miles 40 to 60 cents at 1 cent per kilowatt-hour. The trips with total load of 4.2 tons cost $1.50 to $2, wages $1.80 for driver only, with taxes, repairs and garage bringing the total running cost to from $5.20 to $6.80. The Vienna line passes through narrow streets and around sharp corners on grades of 10 per cent for a long distance. The negative pole is connected to the Vienna city electric tracks and the positive pole of the trackless trolley to the city conduit conductors. There are four cars each carrying twenty-four passengers, loops being arranged so that the cars are running around continuously.

FIG. 3—SIDE VIEW OF GERMAN BUS USED AS TRACKLESS TROLLEY

WHITE Gasoline and Steam CARS

FIG. 1—WHITE GASOLINE CHASSIS, WITH FOUR-CYLINDER, UNIT-CASTING MOTOR AND SELECTIVE GEARSET

ONE of the most interesting announcements so far for the 1910 season and one that has been widely anticipated and whispered about for a month or 6 weeks is that the White Co., Cleveland, O., will for next year have in addition to its two steam types a 20-horsepower gasoline model made in two types, with identical power plant, but differing in details of running gear and body construction. Since the early days of motoring the White Co. has been a conspicuous figure in the industry combatting, as it has done, single handedly the criticisms of the entire field of gasoline builders against the semi-flash-generator type of steam car. In the manufacture of this type of steam car the company has, and does today, occupy a unique position controlling, as it does, the major and basic patents on this method of steam generation; and having solved satisfactorily the problem of the use of highly superheated, high-pressure and high temperature use of steam. The 20 and 40-horsepower steam models which have been on the market this year will be continued with several minor improvements but a major one in conjunction with them is that kerosene will be used as a fuel for generating steam instead of gasoline, which has been the standard fuel up to the present time. This is an important announcement in that it brings motor cars into the kerosene realm, a field with which every citizen outside of the range of large cities has been familiar with since youth.

The Gasoline Type

The 20-horsepower gasoline model shows a careful study of the entire gasoline field up to the present time, and although containing nothing of a radical nature, it bristles with simplicity, incorporates some constructions being used for the first time in America this year and other designs seen on European cars. It is a four-cylinder four-cycle type with cylinders en bloc, all in one casting, and having 3¾-inch bore and 5⅛-inch stroke, a relationship or bore and stroke entirely in sympathy with several foreign builders but one in which the stroke is longer in proportion to the bore than in any other American car announced up to the present time. The remainder of the car chassis includes a cone clutch, four-speed selective gearset with direct drive on the third speed, shaft drive with two universal joints in the propeller shaft, two-bearing crankshaft carried on annular ball bearings, magneto ignition, and both the motor and gearset supported by three-point suspension systems from cross members of the car frame. The wheelbase measures 110 inches.

To the spectator taking his first glance at this new White chassis the most noticeable feature is the absence of piping around the motor, there being neither intake manifold, exhaust manifold nor water manifolds in sight. The mechanically-operated intake and exhaust valves are all located on the left side of the engine, but the valve springs are not visible, a quickly-detachable plate enclosing them from dust and dirt. The spark plugs are carried on this side and at the front is the centrifugal water pump from which the single intake water pipe leads to the jacket. Centrally located is the carbureter and exitting from the rear of the unit motor casting is the one pipe to the muffler.

Lubrication is incorporated with the motor in that the oiler is an integral part of the aluminum crankcase being located at the left rear of it. The oil leads are on the right side of the engine. The oil pump driven from the camshaft supplies oil direct to the connecting rod bearings and the crankcase by way of an adjustable sight feed on the dash. The use of annular ball bearings carrying the crankshaft eliminates the necessity of separate oil leads to them. The connecting rod bearings are Parson's white metal. The gears driving the camshaft, water pump and magneto are of fibre and metal and are entirely enclosed. The only device on the right side of the motor is the Bosch magneto and the wiring is confined to four

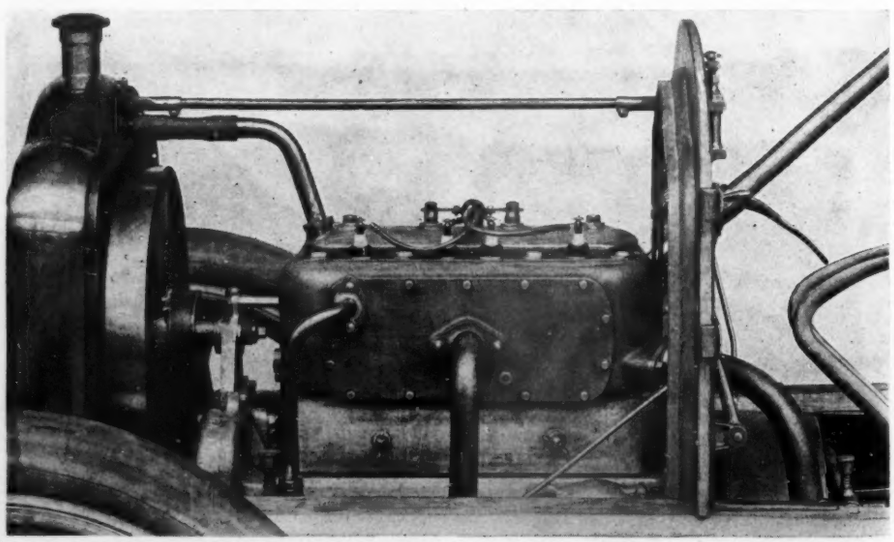


FIG. 2—VALVE SIDE OF WHITE FOUR-CYLINDER GASOLINE MOTOR

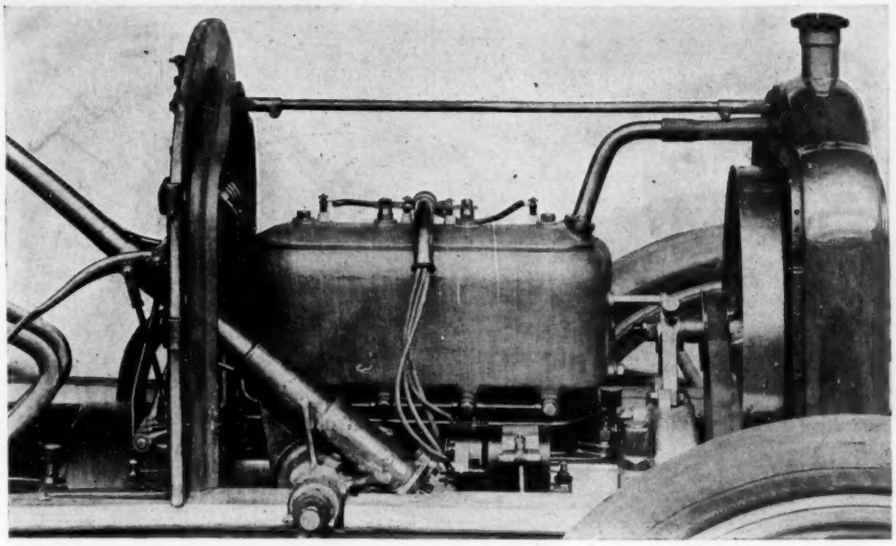


FIG. 3—MAGNETO SIDE WHITE GASOLINE MOTOR

leads from the magneto to the plugs.

In the running gear are used a pressed steel frame narrowed at the dash to increase the turning angle; I-beam front axle; annular ball bearings in the front wheels and rear axle; a honeycomb radiator which follows in contour the general lines of the condenser used on White steam cars; and a selective gearset with four forward speeds and direct drive on the third instead of the fourth. At a later date Motor Age expects to give completer details and illustrations of this new car.

White Steam Models

Although introducing a gasoline model the White Co. announces plans for building for 1910 a greater number of steam cars than for any season previous to or including the present one, with the great modification of using kerosene for fuel as previously mentioned. The 20-horsepower car at present known as model O will be officially designated model O-O, presumably styled "double O." It has a longer wheelbase, 6 inches being added and bringing the measurement up to 110 inches. In this elongating process of 6 inches the power plant has been moved back so that the condenser is directly above the front axle instead of in advance of it. In addition to this the only exterior indication of change is the new shape of fender. The frame is of pressed steel; annular ball bearings are used throughout; an I-beam front axle is used; and 32 by 3½-inch tires are the front and rear equipment.

The engine is compound, vertical and of the same compact construction as in the 1909 model, with a high-pressure cylinder of 2½-inch bore, a low-pressure cylinder of 4¼-inch bore, and a stroke of 3 inches. The crankshaft is a short, one-piece forging of tool steel with but two main bearings. Both the high-pressure valve and the low-pressure valve are piston valves and are driven direct from the connecting rods, by what is known as the Joy valve mechanism. The two main bearings and the two connecting rod bearings are fitted with ball bearings of unusually large size.

A change has been made in the method of driving the two pumps which supply water to the generator. Instead of being driven from the valve gearing, as in the 1909 engine, they are driven from an eccentric. This eccentric is located outside of the crankcase, at the rear of the engine, and is forged integrally with that part of the universal joint which is attached to the crankshaft, as clearly shown in Fig. 5. As in the 1909 engine, the pump which returns water from the condenser to the tank and the air pump which supplies pressure for the fuel tank and for inflating tires, are driven directly from the valve mechanism.

40-Horsepower Steam Car

The 1910 40-horsepower steamer will be known as the model M-M, to indicate its close relationship to the model M of 1909. The most marked change in the external appearance of the new car is that the steering post is tilted considerably more than in the previous model and the shape of the mud guards has been changed. The wheelbase remains unaltered at 122 inches. The frame is of steel, replacing the armored-wood construction formerly used. The M-M engine has all the characteristics of the model O-O engine, described briefly above, including the feature of driving the water pumps by means of an eccentric located outside of the crankcase. The dimensions of the model M-M engine are: high-pressure cylinder, 3-inch bore; low-pressure cylinder, 5-inch bore, and stroke, 4½ inches. It is equipped with 36 by 4-inch tires on the front wheels and 36 by 5 on the rear wheels.

General Steam Features

In order to use kerosene as fuel, no change has been made in the burner proper. The only modifications are in the vaporizer and in the shutter controlling the amount of air admitted to the burner. As in the case of many other great mechanical advances, the desired end—in this case to use kerosene as fuel—is obtained by means which are unexpectedly simple. As for the degree of success obtained by the designers of the White in adapting the car for the use of kerosene, it is only necessary to say that, when the car is in operation, it is practically impossible for any one to tell whether kerosene or gasoline is be-

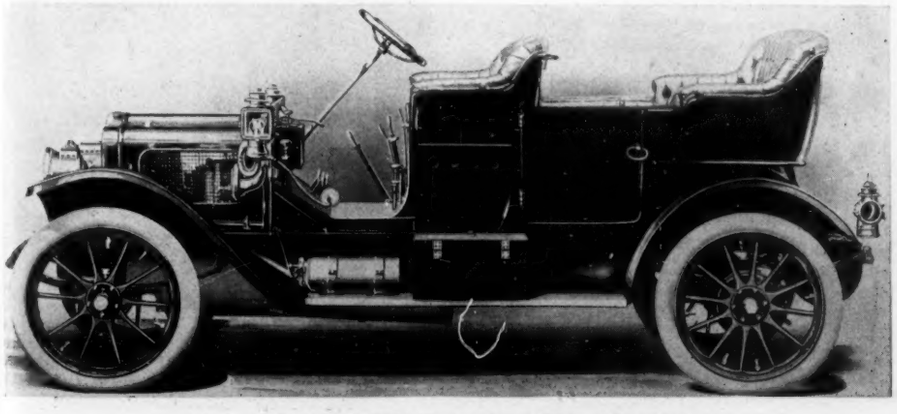


FIG. 4—MODEL O-O 20-HORSEPOWER WHITE STEAMER

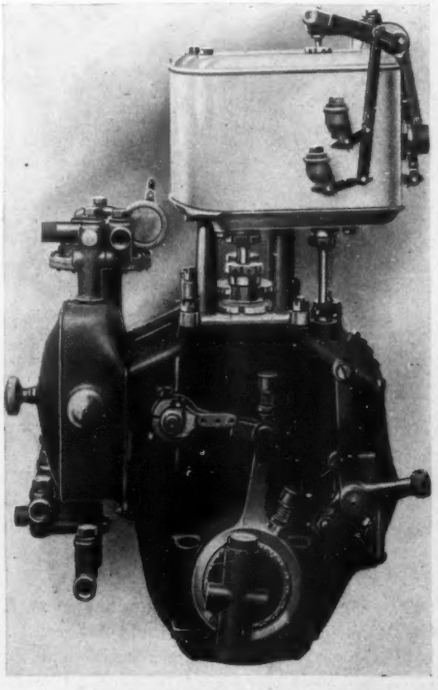


FIG. 5—WHITE STEAM ENGINE

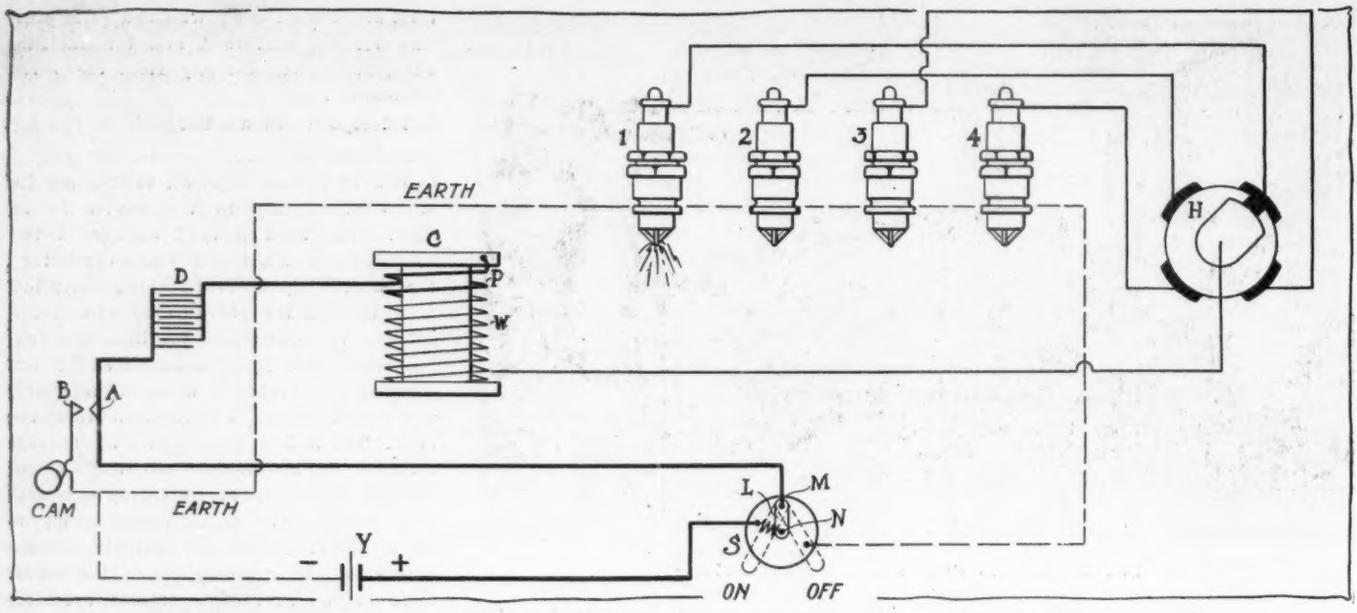


FIG. 6—DIAGRAMMATIC ARRANGEMENT OF THE SIMMS MAGNETO SELF-STARTER

FIG. 7—SIMMS' SELF-STARTER SWITCH

ing used as fuel. When starting the car cold, it takes about 5 minutes longer to heat the vaporizer sufficiently so that the main fuel supply may be turned on but, thereafter, the action and operation of the car are the same as when gasoline is used as fuel. Only a few minutes are required to make the necessary adjustments to the vaporizer and to the shutter so that the fuel may be changed from kerosene to gasoline, or vice versa.

The generator in both the models M-M and O-O is of the usual White construction, consisting of nine coils of steel tubing so joined together that, in operation, water is supplied to the upper coil and steam issues from the lower coil. No change has been made in the regulating system; that is, the temperature and pressure of the steam remains practically constant without in any way engaging or requiring the attention of the driver, no matter what the running conditions may be.

SIMMS MAGNETO STARTER

The Simms Magneto Co., London, through its American representative, Albert R. Miller, New York city, is marketing one of the Simms magneto models, type S4 with a self-starter device, in which it is necessary to press a button on the dash of the car to start the motor, providing there is a quantity of gas in the cylinders. This self-starter does not call for any difference in the magneto construction other than the circuit breaker. Fig. 8 shows the end of the Simms magneto in which the make-and-break points A and B are shown together, these points being normally in contact, whereas Fig. 9 illustrates the contact breaker used with the self-starter, in which the points A and B are separated, so that the armature primary circuit is normally open, whereas in Fig. 8 it is normally closed. This is the sum total of the difference between the two magnetos and is the secret of the self-starting device.

The self-starter is diagrammatically illustrated. Fig. 6 and 1, 2, 3 and 4 designate the four spark plugs, Y the dry battery or storage cell used for self-starting purposes, S the switch on the dash of the car, C the core of a magneto, P the primary winding, W the secondary winding, D the condenser of the magneto and H the magneto distributer, A and B the make-and break points in the contact breaker of a magneto, which points are normally separated except when the circuit is made by the rotation of the cam. The primary circuit is indicated by the heavy winding from the magneto core to the condenser, to the breaker point A, and the central point of the switch S. There is also a primary circuit from the switch to the dry cell Y used for self-starting as well as a ground.

Before understanding entirely the operation of the self-starter, an analysis of the switch on the dash is essential. The exterior of it, Fig. 10, shows a fiber button Z which it is necessary to tap in order for the self-starter to operate. Before this is tapped, however, the handle must be moved to the left to the "on" position, and this handle when moved into the "off" position the primary winding is earthed and the magneto cut out. With the handle in the "on" position the pressure of the button acts on the flat spring L, Fig. 6, connecting the terminals N and M, which terminals are normally out of contact except when the buttons are tapped. When this is done, a current from the dry cell passes through the primary of the magneto energizing the magneto core C and the sudden break of this primary current, immediately the button on the switch is used, results in an induced current in the primary winding on the magneto which is delivered through the distributer H to one of the plugs where a spark takes place. It is essential in this self-starter that the contacts A and B be separated and also that the distributer

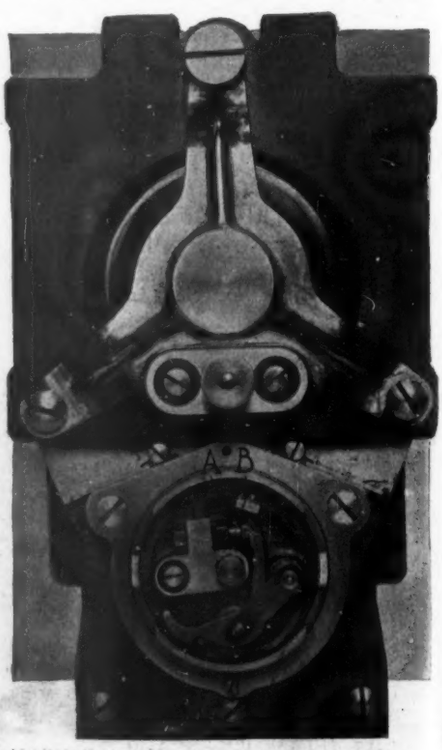


FIG. 8—STANDARD SIMMS' BREAKER BOX

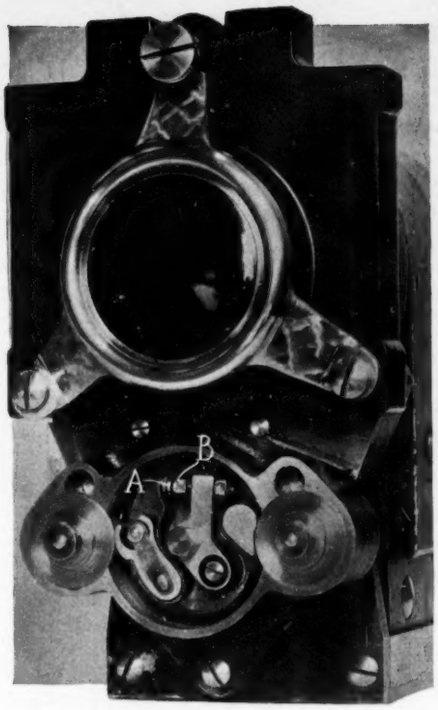


FIG. 9—SELF-STARTER SIMMS' BREAKER BOX

blade H be in connection with one of the cylinders. In the starter switch is a coil of wire through which the current from the dry cell must pass. This coil is to protect the primary winding of the armature from too high a voltage, but where a low voltage cell is used it is not necessary. The self-starter can be attached to any Simms or Simms-Bosch magneto. The starter handle has a neutral position when vertical and at which time the motor can be freely cranked for starting.

MANUFACTURING NOTES

Two of the Diamond tires on the Chalmers-Detroit flag-to-flag car, which made the run from Denver to Mexico laying out the route for the tour during the coming fall, carried the original air in them to the Mexican capital. One of the remaining four tires was punctured, and the other suffered two punctures.

The Rambler cars are now provided with a gasoline lock which prevents the gasoline supply reaching the motor except after the supply has been made fast by turning a small key. This lock has been added by Thomas B. Jeffery & Co. to prevent the stealing of cars while left standing by the curb.

The Motorists' Bookman

A MOST valuable book on factory systems is "Nicholson On Factory Organization and Cost," by J. Lee Nicholson, and published by the Kohl Technical Publishing Co., New York. This book, 410 pages, is of 8 by 11-inch size and contains forty-three chapters as well as numerous illustrations on various factory systems. The book is illustrated throughout with blank forms for the different departments. As an example: Purchase orders in different styles, purchase requisitions, report of material received in a dozen styles, raw material stock cards, foundry production orders, production orders, sub-production orders, material requisitions, report of materials delivered, time reports, pay roll sheets, production reports, finished stock card reports, cost sheets, department costs, defective work reports, factory expenditure reports, registers of sales, etc. Some of the leading chapters deal with wage systems, organization and cost finding, analysis of cost accounting, distribution of indirect expenses, cash system, factory expenditure, special order system and mechanical appliances suitable for office use. So profuse are the illustrations of factory form sheets that it is possible to install a complete system from the forms illustrated. In conjunction with the illustrations is text illustrative of the different ones, as well as outlining the advantages and disadvantages of the different systems.

"Motor Tours In Wales and the Border Counties," by Rudolph Staywell, and from the press of L. Page & Co., Boston, is one of the many interesting touring books on England. It is a profusely illustrated, 300-page, cloth-bound volume, the majority of the illustrations in which are full-page reproductions of historical and quaint incidents throughout Wales. The book is not a running story of what can be seen and heard in a hurried trip through the country, but is replete with historical references to the buildings and country, which can only be obtained by close study of Welsh history from the past up to the present. Reading a book of this nature before taking a motor trip through the land referred to is one of the best preparations for a trip, and makes it possible to get that real enjoyment which a tour through Wales deserves. The book is not an itinerary of so-many-days touring, but a careful typographical analysis of the historical and natural beauties of the country. In spite of this, however, it is possible to frame most interesting tours through the country from the several chapters.

"The Gas Engine In Principle and Practice," by A. H. Goldingham, and published by Gas Power Publishing Co., St. Joseph, Mich., in a 200-page standard size cloth-bound volume on the gas engine. The book treats of the stationary type entirely, no matter relevant to the combustion engine on the motor car being introduced.

The Fisk Rubber Co. has issued a series of colored posters in the interests of its demountable rim. Each poster depicts a common situation in conjunction with touring, some showing troubles without demountable rims.

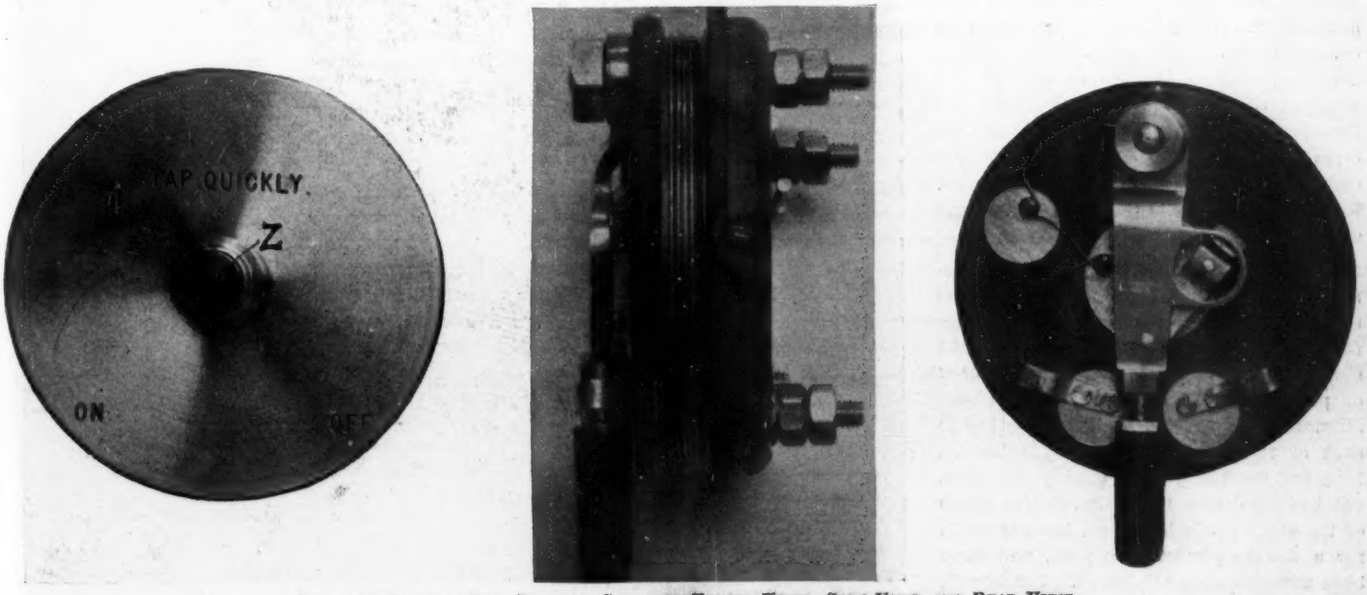


FIG. 10—SIMMS' SELF-STARTER SWITCH—FRONT VIEW, SIDE VIEW AND REAR VIEW

From the Four Winds

N S E W

Utah Club Election—The Automobile Club of Utah has elected the following officers: President, Samuel Newhouse; vice-president, C. A. Quigley; secretary and treasurer, J. E. Jennings.

Want Ban Removed—The Industrial Club of Cheyenne, Wyo., is endeavoring to have the ban on motor cars entering Yellowstone National park removed. At present cars are not permitted in the park, passenger transportation being by stage coach only.

Taft Joins Motor Club—President William H. Taft is a full-fledged member of the Automobile Club of Cincinnati, according to the action of the club at its last meeting of the board of directors. As Cincinnati is the home of the president it is considered fitting and an honor that his motor club membership should be held there.

Working On Alaska Roads—A large force of men will begin grading on a new 500-mile highway between Valdez and Fairbanks, Alaska, as soon as the snow and frost leaves the ground. It is expected to have the route made passable for motor cars by fall, and that by 1911 it will be possible to use commercial vehicles with heavy freight outfits the year round.

Detroit's Glidden Plans—Arrangements are already under discussion for the entertainment of the Glidden tourists when they gather in Detroit for the start of the big event June 12. A committee of the Detroit Automobile Dealers' Association, comprised of Charles Grant, chairman; Robert K. Davis, Frank Briscoe, William E. Metzger and W. R. Orr, has been appointed to take charge of the festivities.

Would License Drivers—The Detroit common council is deliberating over a measure providing for the licensing of chauffeurs of taxicabs and an endeavor has been made in committee to enlarge the scope of the ordinance to provide for the licensing of all drivers of motor cars. Two reports are predicted and a thorough discussion of both is certain to take place when the ordinance is taken up for passage or rejection.

More Road Funds—State Highway Commissioner Wonders, of Columbus, O., is busily engaged in distributing the state funds appropriated for the purpose of road building in Ohio this summer. A number of petitions for funds have already been allowed, and $5,586.76 has been allotted to each of thirty-one counties, while Lorain, Medina, Sandusky and Shelby counties, not having drawn their distributive share of the state funds last year, have come in for a double portion this year, and have been awarded each $10,586.76. The benefit of state aid in road building is becoming more and more apparent, and it is certain that the effect will soon be noticeable in improved highways in all parts of the state.

Object to Horns—Tooting of horns will be restricted in certain sections of Lincoln if an ordinance prepared jointly by the club and a special committee of the city council succeeds of passage. An ordinance has also been recommended limiting the age at which persons can operate a motor car to 17 years for gasoline cars and 15 years for drivers of electrics.

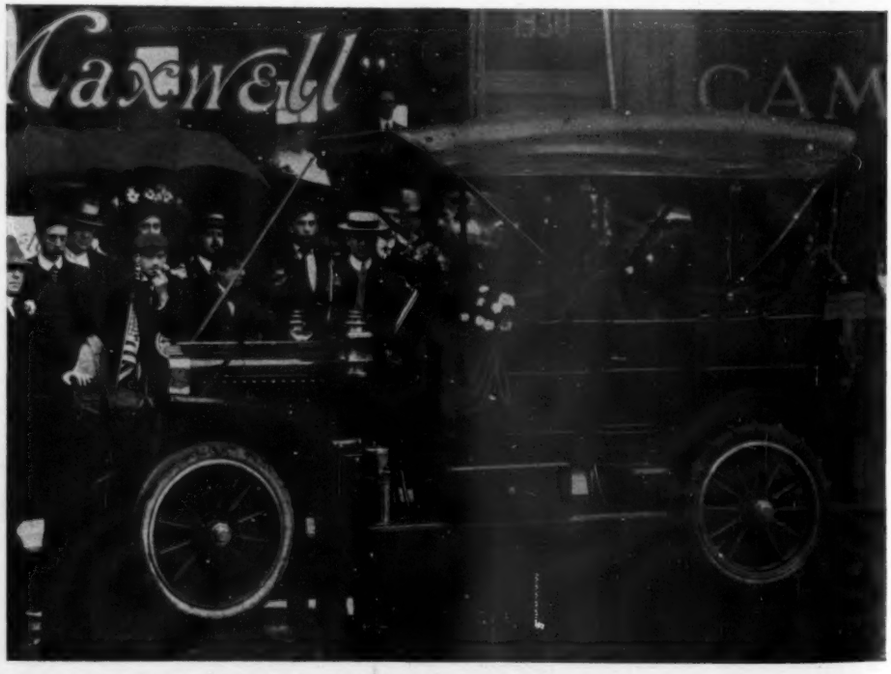
Rode Free Horse to Death—When conventions and large gatherings assemble in Topeka, Kan., hereafter they will miss the customary motor car rides about the city. It has been the practice of the Commercial Club, working in conjunction with the motor club to furnish cars for pleasure trips about the city. These calls have become so numerous that the club feels it is an imposition on the owners. The Commercial Club has decided to not again ask the owners to furnish their cars.

Ride For Blind Children—The annual outing of the blind children of the Perkins institute and kindergarten for the blind in Boston took place last week, when some 200 youngsters were given an outing to Sharon. Chester I. Campbell had charge of the outing and he secured more than thirty cars from the Boston dealers for the run. The machines were divided into two divisions, one going to South Boston to the institute and the other to Jamaica Plain to the kindergarten. When the children were all aboard the two divisions met in Mattapan square and from there proceeded to Sharon, where the youngsters spent the day. They were brought back again safely in the afternoon.

Arouse the Assessors—According to the state record there are 742 cars in Douglas county, Neb., and because but 295 of them are on the assessor's books a deputy has been assigned the task of looking up the remainder.

Savannah Will Post Signs—All good roads will lead to Savannah in a few months. At least that is what the southern traveler will think after the Savannah Automobile Club has carried out the plan which has been formulated by Secretary Arthur W. Solomon. Mr. Solomon has ordered a large number of steel signs. These signs are to be the shape and colors of the Savannah Automobile Club pennant, which will be distributed through a territory with a radius of 40 or 50 miles, with Savannah as the starting point.

Progressive Club—The Green County Automobile Club, of Monroe, Wis., has started a sign campaign and boards will be placed at all crossings on the main traveled highways at once. The cost will be borne by the club and the members will do the work of putting them up. The Green County Agricultural Society has asked the club to arrange for several contests during the annual fair in September. A number of purses will be hung up. The club will make its first run of the season on June 20, going to Albany and return.



MRS. RAMSEY IN MAXWELL STARTING TRANSCONTINENTAL TOUR

The members of the club resident in Monroe will construct a model gutter crossing by permission of the common council, the idea being to gradually eliminate all bad crossings within the city limits.

LaCrosse In Line—Two hundred orphans of LaCrosse, Wis., were given an outing by the LaCrosse Automobile Club on June 4, fifty-two machines being in line. The tour ended with a picnic supper in Myrick park.

Mishicott Heard From—The village of Mishicott, Manitowoc county, Wis., claims the honor of having the largest number of motor cars in proportion to the population. Fifteen machines are owned in the village of 500 population.

Reeves In the West—Alfred Reeves, general manager of the American Motor Car Manufacturers Association, is visiting factories in the west. He will visit the makers that are located in Cleveland, Dayton and Cincinnati, O.; New Castle, Muncie, Mishawaka, Auburn, Anderson and Indianapolis, Ind.; St. Louis, Mo.; Peoria, Chicago and Moline, Ill., and Newark, N. Y. A trip next month will take him through Wisconsin and Michigan.

Another Chauffeur's Club—The chauffeurs of Des Moines, Ia., have organized into a club and elected the following officers: President, E. J. Best; secretary, John Gibson; treasurer, Fred Graham. The club was started with twenty charter members. The object of the organization is to promote sociability and protect owners of cars. Many of the Des Moines club members are lending assistance to get the club on a good footing by donating furniture, etc., for clubrooms. It will be known as the Des Moines Chauffeurs' Club.

Minneapolis Run Plans—One hundred dollars in prizes will be hung up by the Minneapolis Automobile Club in the annual Tribune trophy reliability and economy contest scheduled for August, this to be in addition to the handsome silver cup offered by the Minneapolis Tribune. The club prizes will be for amateur drivers who enter the run to Duluth and back and already many of the crack amateur drivers have announced their intention of competing. With this added stimulus it looks as if there would be an entry of between forty and fifty cars.

Women Motorists Start Tour—New York motorists were out in large numbers to give Mrs. Alice Ramsey and friends at the start of the transcontinental tour which will end in San Francisco early next month. In the car at the start, in addition to grips and trunks was a complete cooking outfit, for the tourists go prepared to cook their own meals, which will probably be necessary in the far west. On Thursday the run was to Rochester and Friday to Buffalo. From now on the runs each day will be longer and harder, becoming more so in the far west, the trip across the Rocky mountains being perhaps the most difficult, though by no means the only hard part. Mrs. Ramsey and her friends are taking it purely as an outing and in order to properly see the country which can be seen best, of course, from a motor car.

PRIZE FLOAT IN PARADE AT GRAND RAPIDS, MICH.

After More Members—An active campaign is being made by the Lincoln Automobile Club, of Lincoln, Neb., for new members. There are now forty-seven members enrolled, and with 300 cars in the city the club hopes to increase this number within the next few weeks.

Reception For Knipper—Billy Knipper, the Chalmers-Detroit driver who returned several days ago from Mexico City where he had piloted the flag-to-flag pathfinder, was tendered an ovation at the factory in Detroit, but hardly had time to shake hands and relate a few of his desert experiences before the factory sent him to Chicago for the Indiana trophy race.

Has a Prize Float—Again has the motor car won honors in a procession. In the big civic pageant at Grand Rapids, Mich., June 10, the Grand Rapids Sticky Fly Paper Co., by the use of a car, captured the cup offered for the most novel float in line. The float represented a large fly, caught by a sheet of sticky fly paper. By means of a mechanical arrangement the fly was made to squirm and apparently to make efforts to release itself from the supposed fly paper. The mechanism was operated from the car which also was the motive power of the float, being concealed inside a framework covered with paper flowers. The huge fly was made of papier mache and on the side of the float were the words: "I Am Stuck On Sticky Fly Paper." In the individual class Mrs. T. C. Irwin was awarded a cup as first prize. She drove a Reo touring car elaborately decorated with a mass of white and yellow chrysanthemums. Mrs. Irwin's 2-year-old son sat perched on the front seat driving before him with a pair of ribbons a beautiful yellow and white butterfly.

Go On Long Tour—A tour embracing approximately 4,000 miles has been started by State Geologist Edwin Hall and Immigration Agent C. W. Williams. They will tour the central and northern part of Wyoming, gathering data for use in their departments. It is expected that they will be gone 60 days.

Helping Stop Scorching—Secretary Forman Wilkinson, of the Syracuse Automobile Club, has sent a circular letter to each member of the club asking his co-operation in suppressing all violations of the speed laws and other restrictions on motor cars within the city limits. Already this season there has been a number of accidents, many of which were of a serious nature, within the city limits, and it is the desire of the club officials to see that such driving is effectually checked. The services of the club have been volunteered to the police department.

Minnesota Ambitious—President F. M. Joyce, of the Minnesota State Automobile Association, has set out with the determination of having thirty live, active clubs in the association by July 1, but in the light of recent events he has raised his mark to forty. The past week he organized the twenty-fifth club at Litchfield, Minn., with thirty-two members and on the same trip interviewed the clubs in three other towns, reporting excellent prospects of bringing them into the fold before the month is up. These strenuous efforts are all preliminary to going before the legislature at its next meeting 2 years hence with such a solid front from the motorists that their demands will have weight with the solons.

CHICAGO'S ROW GRADUALLY MOVING SOUTH

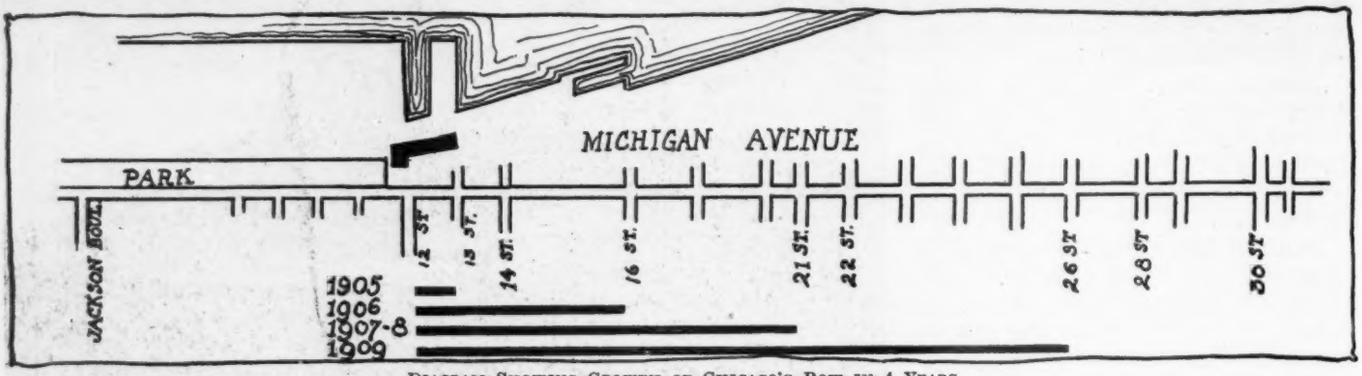


DIAGRAM SHOWING GROWTH OF CHICAGO'S ROW IN 4 YEARS

CHICAGO, June 7—Before fall Chicago's famous Michigan avenue row will extend from Twelfth to Twenty-sixth street, practically 1½ miles in length, with stores on both sides of the street, whereas 5 years ago the Michigan avenue row comprised a little cluster of motor establishments strung from Twelfth to Fourteenth street, and including Ralph Temple, the Winton and Locombile. All this has been brought about by the constantly increasing rents, which have forced branches and agencies to keep going south. At the present time there is every indication that another 3 months will find the heavy artillery located south of Twenty-second street, with the advance guard touching Twenty-sixth street. The Pierce-Arrow, Packard, Premier, Studebaker, Locombile and Inter-State are building in that locality, while the Stearns already is well housed on the east side of Michigan, next door to Henry Nyberg, dealer in second-hand cars. To the south of Nyberg is the garage of the Auto Taxicab Co., and building south of this the new establishment that will be the home of the Acme and which is now well on its way to completion.

Row Moves South

A year and a half ago Walden Shaw moved from Sixteenth street to the corner of Twenty-first, and at the time it was thought he had segregated himself from the entire motor colony. Soon, however, the Oldsmobile branch took the store next door north; but it was not until this spring that others started investigating this new territory. The Western Motor Car Co., handling the Stearns, was the first selling concern to move past Shaw, and it quietly erected a three-story building next to Nyberg, who was the original squatter south of Twenty-fourth street. Before the Stearns building was completed Henry Paulman concluded that the Pierce-Arrow ought to be in the new territory, so he purchased a lot at 2420 Michigan avenue, 50 by 187 feet, and on it he is erecting a two-story building that will be ready for occupancy in a short time. Paulman is located at 1430 now. Just about the time of the Paulman announcement the Chicago Motor Car Co., handling the Packard, found a site for which it had been looking ever since it leased its big store at 1617 Michigan avenue to the Velie people. The Packard representatives are building a three-story building at Twenty-fourth street, which has a frontage of 60 feet on the avenue and a depth of 193 feet on Twenty-fourth street, while there is to be another section on Twenty-fourth street running back 127 feet to an east and west alley. This, it is thought, will be ready for occupancy by August 1, but so far nothing has been done in the building line outside of clearing the lot.

Webb Jay Gets the Fever

Webb Jay, who is now located at Michigan and Harrison, got the fever just about this time and bought the lot at 2329 Michigan avenue, making him a close neighbor to the Packard. Here Jay will erect the new home of the Premier. He has his lot cleared and the building that will go up will be three stories in height and thoroughly modern in every respect. Next to join in the chorus was the Locombile company, whose branch has been at Fourteenth street since the opening of the row on Michigan avenue. It, however, is not going as far south as the others, a choice lot at Twentieth street having been purchased upon which will be erected a three-story building, the lot being 75x171 feet and the building to be of reinforced concrete and steel.

Hardly had the echo of the Locomobile announcement died away before the Studebaker was heard from. For years Studebakers have been sold from 378 Wabash avenue, where also are handled the carriage business of the concern, but this spring the powers that be decreed that the two businesses should be segregated, and with that idea in mind they took a 20-year lease on the property at the northwest corner of Michigan avenue and Twenty-first street, across the way from Shaw's. The lot is 73.5 feet by 172, and already it has been cleared of the old mansion that formerly occupied it. It will be a most pretentious establishment, seven stories in height and here the motor car business of the company will be handled.

Inter-State in the Colony

The latest to decide to join the southern colony is the Inter-State Motor Car Co., which has been incorporated to handle the

NEW HOME OF PIERCE-ARROW AT SOUTH END OF ROW

product of the Inter-State Automobile Co., of Muncie, Ind. This new concern, which is under the management of E. C. Lester, is clearing a site for a three-story building at 2425 Michigan, a door or so north of the Stearns. The building will be 161 feet deep and 25 feet wide, with a large garage in the rear. At the present time the company is occupying temporary quarters at 1328 Michigan avenue.

The Renault branch, too, has moved into new quarters, although it has not gone so far south, being content to jump from 1549 to 1606, where a new two-story building has been erected. At 1806 the National agency is in a new building which was completed at about show time.

As it exists at present Chicago's row is a wonderful one, including eighty-two buildings devoted to the selling of motor cars and their allied industries. There are ninety-five different concerns doing business in these eighty-two buildings, of which fifty-seven handle cars. One can best appreciate the growth of the row by remembering that in 1899 its nucleus was started at the corner of Wabash avenue and Van Buren street, when Ralph Temple, handling the National electrics, and the Mobile and the Locombile were clustered there, while Frank Illsley with the Autocar came a year later.

Start of the Row

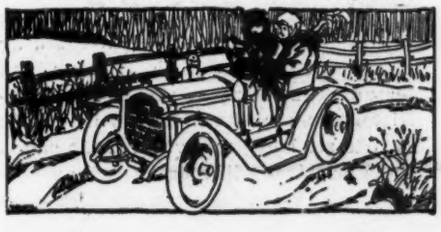
It was not until 1903 that the migration to Michigan avenue started. That year the Winton company established its branch at Thirteenth street, where it still is. Temple soon followed, locating at 309 Michigan. Walter Githens with the Oldsmobile was next, joining the colony in 1904, at about the same time that the Locombile branch was established at Fourteenth street, where it now is, but which will soon move to Twentieth street. These were the pioneers on Michigan avenue, and since that time the row has gradually expanded. The tendency has been to go south, but the progress has been slow until this year. In 1906 the block between Fourteenth and Sixteenth began to fill up, nearly everyone striving to get into this section. The result being that it is the most thickly congested on the row. Naturally, then, as soon as all the stores were gone those dealers who could not get desirable locations sought elsewhere, which accounts for the extension of the row. Up to 1907 the Shaw company was the southern sentinel at 1532. Then the Packard cut in at 1617 and later the Haynes went in at 1702, the Baker electric at 1714 and Adams & Engs at 1712. Thereupon Shaw jumped to Twentieth street and again was southern sentinel.

As it will be in the fall of this year, the row proper will extend from Twelfth to Twenty-sixth street. North of Twelfth street the only selling concern will be the White company's branch, which, however, is thinking of moving. At 309 there is a concern selling second-hand cars. Wabash avenue, formerly a hotbed of motor activities, is almost deserted by the pleasure car brigade, the Studebaker being the only one there now. Several concerns selling commercial wagons are located there though. The heart of the row will continue between Fourteenth and Sixteenth for some time yet, it is thought, while most of the higher priced cars will be sold in the south end.

STEARNS, NYBERG AND ACME, SOUTHERN SENTINELS ON ROW

MOTOR CARS IN ENGLAND

Washington, D. C., June 14—In the Daily Consular and Trade Reports Consul-General Robert J. Wynne states that up-to-date and interesting figures in the London Morning Post of April 16 show the gradually lessening cost of motor cars, coincident with their improvement in England. These figures will furnish American makers the latest data necessary to determine what margin for profit there may be in the endeavor to place additional American machines abroad in competition with the more-favored home-made article. In 1901 a 6-horsepower British car without a body cost $1,850, but today a two-seated 7-horsepower machine complete can be purchased for $900. Only firms of wide repute can be considered in discussing competition under existing conditions, it is argued, for it would be folly for any small firm to attempt to compete against the big ones. A comprehensive idea of the manner in which the motor car has developed in England from a small to a powerful and very speedy vehicle in the brief space of 8 years may be gathered from the following summary of prices which is furnished by the consul-general:



Year	Nominal horsepower	Price of chassis
1901	6	2-cyl., $1,950
1903	22	4-cyl., $4,950
1904	28	4-cyl.
1905	30-40	4-cyl.
1906	35-40	4-cyl.
1907	45	4-cyl.
1908	58	4-cyl., $4,125
1909	38	4-cyl., $2,800
1909	22	Live-axle, $2,375

The Morning Post says: Whereas the 6-horsepower car of 1901 was to all intents and purposes a machine of no more than 6 horsepower, the nominal 38-horsepower machine of 1909 has an engine capable of developing something nearer 60 horsepower for hour after hour without fatigue, while the 22-horsepower car is in like proportion powerful far beyond the extent indicated according to Royal Automobile Club rating, so that for $425 more than the cost of the 6 horsepower chassis of 1901 the motorist can buy a machine of at least 37 actual horsepower—nominal 22-horsepower 1909 type—embodying not only all the refinements of latest practice, such as a live-axle drive, but also a 2-year guarantee, with the exclusive silent sliding-valve type of motor that has received the seal of success in the severest officially observed engine trial on record in any country. Taking the figure given above for a 6-horsepower car of 1901 as being $2,200 complete, these prices may be quoted for complete cars:

Year	Horsepower	Price
1905	8	$1,025
1906	8	1,035
1907	8-10	995
1908	8-10	995
1909	7- 9	700
1905	12	1,700
1906	10-12	1,335
1907	10-12	1,350
1908	10-12	1,350
1909	10-12	1,350

The lists illustrate two things: First, how the price of the quite small car has been appreciably reduced—over 25 per cent—second, it has not been possible to reduce the price of the larger sizes to an equivalent extent.

Among the MAKERS and DEALERS

NEW PLANT OF THE RIDER-LEWIS MOTOR CAR CO., OF ANDERSON, IND.

Chicago Brush Manager—Leslie B. Sanders has been made manager of the Chicago Brush branch.

After a Truck Plant—Ann Arbor, Mich., is in hopes that it may land the Soules motor truck factories. Representatives of the company have been in conference with Ann Arbor business men and capitalists in regard to the matter.

Big Demand for Springs—The demand for motor car springs has caused the Hess Spring & Axle Works at Pontiac, Mich., to put on a night shift at the factory. The company is planning to erect three additions to its spring department in the near future and these will increase the floor space by 8,000 feet.

Another Converted—A modern three-story garage will be erected at 935 North Howard street, in Baltimore, Md., by Michael Griffin at a cost of $25,000. The garage will front 75 feet and extend back to a depth of 96 feet and will be fireproof. It will be of ornamental press brick with stone trimmings. The foundation will be of concrete and the roofing slag. Mr. Griffin, who at present conducts a large livery stable, it is understood, is putting up the garage with the intention of entering the motor car business.

Making Metal Bodies—Both lightweight and shapliness of design are results which are contributed to by the use of sheet aluminum in the construction of car bodies. While some designers have increasingly made use of the straight line in the shaping of the bodies, such shaping being specially adapted to certain materials, the use of aluminum has made it possible for others to easily retain the beauty of the curve. In the metal body department at the Franklin factory the material passes rapidly from the stage of raw stock to that of the finished body. Sheets of the aluminum are cut and shaped into a steel angle frame and then riveted in place. The surfaces are ground and draw filed for painting. Doors of cast aluminum are hung, and there is a complete body assembly to make certain that all parts fit as they should.

Diebler Takes an Agency—Joseph B. Diebler, formerly manager of the Chicago Haynes branch, has taken the agency for the Pope-Hartford. He has not as yet secured a location.

Supply Company in Trouble—An involuntary petition in bankruptcy has been filed against the Thomas D. Buick Auto Supply Co., of Flint, Mich. Among the creditors are the Diamond Rubber Co., of Akron, O.; the Fanning Tire Co., of Chicago, and the Stewart & Clark Mfg. Co., of Chicago. The claims aggregate in the neighborhood of $800. The petition has been referred to Lee E. Joslyn, referee in bankruptcy. The supply company has no connection with the Buick Motor Co.

Curtin in Control—Thomas E. Curtin, president of the Curtin-Williams Automobile Co., of Columbus, O., has purchased the holdings of C. Edward Born in the company. Mr. Born has also resigned from the board of directors, with which he had been identified for three years. The sale was made in order that Mr. Born can give his attention to numerous other interests which demand his time. Mr. Curtin now controls the corporation, having ownership of practically all of the stock.

Busy In Western Europe—The Daily Consular and Trade Reports advise that "according to reports of American consuls there are signs of great activity in the motor car business in certain sections of western Europe during the present season. Tourist and passenger routes are being planned and laid out wherever the traffic would seem to warrant it, and a number of machines will be purchased by private persons for both business and pleasure. The barriers that formerly restricted the use of motor cars in certain districts are being removed and the march of the machines will soon be free and unrestricted. Plans have already been completed for the establishment of several lines for carrying mails, passengers and tourists."

Big Fire in Chicago—A fire which broke out at 1332 Michigan avenue, Chicago, Sunday morning, about thirty motor cars valued at about $70,000 being badly damaged or destroyed. The damage to cars, equipment and office fixtures in the sales and stock rooms of the Brush and American Mors stores, which occupied the front part of the building, is rated at about $6,000 each; while the injury to the property of the Chicago Taxicab Co., which occupied the rear of the building, said to amount to $60,000.

New Boston Slate—There was only one change made in the officers at the election of the Boston Automobile Dealers' Association held last week in Boston. F. E. Wing succeeded George H. Lowe on the board of directors. The officers are President James H. MacAlman, of the Stearns and Columbia; vice-president, J. S. Hathaway, of the White; treasurer, F. A. Hinchcliffe, of the Winton; secretary, Chester I. Campbell. The board of directors comprise the above with J. W. Maguire, Pierce-Arrow; Charles E. Fay, Ford; A. P. Underhill, Knox; C. F. Whiteney, Stoddard-Dayton and Alco; E. A. Gilmore, Thomas, Chalmers-Detroit and Hudson, and F. E. Wing, Marmon.

City Loses Taxes—Some time ago the city of Hartford endeavored to force the receivers of the Pope Mfg. Co. to pay about $6,000 taxes on a bank deposit of $291,050, which the receivers deposited in a local bank subject to orders of the court for transfer to New Jersey to pay dividends to creditors. The question of this money being taxable came up before Judge William L. Bennett in the superior court. It was stated that at the time this money was assessed last October, it appeared that the court issued an order transferring $100,000 of the money to New Jersey and in November another court order trans-

ferred $163,000 to New Jersey to pay a final dividend to the creditors of the Pope Mfg. Co. The city has lost out, however, the decision being virtually in favor of the company.

Succeeds Walters Company—The Mercer Automobile Co., authorized capital $500,000, was incorporated at Trenton, N. J., last Friday. The corporation was formed to take over the business of the Walters Automobile Co., of Trenton, which recently went into the hands of a receiver. The incorporators of the new company are: Colonel A. R. Kuser, of Bernardsville, N. J., and John L. Kuser, S. W. Roebling and Charles D. Roebling, of Trenton.

Branching Out—With the erection of a new plant in the south end of the city in the vicinity of the Flint Vehicle Co.'s plant at Flint, Mich., the Fleetwood Engineering Co. will add to its machine and pattern business the manufacture of parts and a four-cylinder gasoline car of a new design. The company is capitalized at $50,000, and it is announced that this will not be changed at present. The new plant will be of brick, two stories high, 130 feet long and 50 feet wide in front and 70 feet wide in the rear. It will be ready for occupancy in about 4 weeks.

Change in Omaha—In order to separate his steamers and electrics from the line of gasoline cars he handles, thus providing more room for both lines, R. R. Kimball, of Omaha, Neb., has closed a deal for the purchase of the stock of the Omaha Automobile and Garage Co., at 2513-15 Leavenworth street, and leased the building for 1 year, with privilege of renewal for 2 or 3 years. The new building, which was erected especially for a garage, is a brick structure of a single story and commodious basement, 40 by 60 feet. By the change the Stanley steamer and the Babcock electric will make their home at the Leavenworth street location, leaving the Cadillac and Stevens-Duryea at the garage and showroom on Farnam street.

Will Help the Owner—The Auto Reporting Co., with offices in the Real Estate Trust building, Philadelphia, was organized last week. Among the objects of the new concern are the protection of owners against the unlawful use of their cars and the furnishing of accurate information regarding chauffeurs. The company's sleuths will constantly patrol the main roads in and about the Quaker City, and tabs will be kept on the movements of subscribers' cars—excessive speeding, outrageous conduct, accidents and breakdowns will all be noted and confidential transcripts sent upon request to any subscriber. Those at the head of the new company are prominent in the affairs of the Quaker City Motor Club, while the Vidocqing will be in the hands of several prominent local detectives. The president is L. D. Berger, who is also president of the Q. C. M. C.; vice-president, Charles J. Swain, an ex-president of the Quakers; secretary-treasurer, Frank J. Curran; counsel, G. Douglas Bartlett, the Quakers' legal sharp; general manager, Charles D. Sell—the foregoing and George M. Costello, Thomas J. Curley and Howard W. Frame constituting the board of directors.

HEADQUARTERS OF YAKIMA AUTO CO., IN NORTH YAKIMA, WASH.

New Top Company—The Pontiac Auto Top Co. will be the name of a new company to be organized at Pontiac, Mich. The stockholders will be C. V. Taylor, O. J. Beaudette and R. F. Monroe. Mr. Taylor will be manager. Tops will be manufactured exclusively. Work on the factory, which will be in the old phaeton plant, will be started soon.

Big Kissel Deal—The Kisselkar Co., of Milwaukee, Wis., state agent for the Kisselkar, will next season become a much greater factor, announcement being made this week that the entire southwestern part of the United States has been placed under its jurisdiction. Branches will be opened in the principal cities. Executive offices will be in Milwaukee, under personal charge of Frank J. Edwards, president of the Kisselkar Co. O. L. Curtis will manage the Kansas City branch and N. E. Osmond will supervise the Milwaukee branch. Branches will be opened in St. Louis, Omaha, Little Rock and other southwestern metropolises.

EMPIRE'S NEW CHICAGO STORE

New Empire Tire Store—The Empire Tire Co. has a new store at 1305 Michigan avenue, Chicago, of which E. B. McKay is manager. The company has moved its branch from 20 LaSalle street in order to facilitate the handling of its growing business.

Hibbard Company Enlarging—The W. L. Hibbard Motor Car Co., of Milwaukee, Wis., will take possession of its new garage at 417-421 Wells street on June 15. In addition to the Chalmers-Detroit and Thomas lines, this company will handle the Hudson, made by the Hudson Motor Car Co., of Detroit.

Hartford Changes—A. E. Friswell, formerly superintendent of the Hartford Rubber Works Co., of Hartford, Conn., has severed his connection with that company and is succeeded by C. B. Whittlesey, formerly assistant superintendent. Richard C. Skinner, formerly manager of the rim department of the Hartford Rubber Works Co., has severed his connection with that company and is now affiliated with the Atlas Rubber Co., of Buffalo, as New England representative with headquarters in Boston.

New Detroit Garage—The J. H. Brady Auto Co., of Detroit, Mich., is now engaged in moving its stock and office paraphernalia from the stand on Woodward avenue to the new building which has been erected for its purposes at Jefferson and Beaubien street. The garage is quite unique in its way, a sharp drop in the level of the ground at this point enabling the firm to have a grade entrance on Jefferson avenue, admitting to the office and show room, while the garage proper and repair room, opening on the side street, will be one story below but also on the grade of the highway. This arrangement presents several opportunities for novelty which would have been impossible in the usual plan of construction. The Brady Co. will handle the Pope-Hartford and Peerless cars, as in the past, and also announces that it will be the local distributor for the new Hudson car.

The Motor Car Repair Shop

KEY-FITTING is of more importance than most amateur repairmen are apt to consider it. Upon the proper fitting of keys in their key-ways depends much of the stability and permanence of wheels upon their shafts. Keys are made either to lie upon a flat surface filed upon the shaft, or in grooves or recesses cut into the shaft. Except for the very lightest work the latter is invariably adopted. The key-ways in shaft and wheel are not always made the same way. In the shaft they are generally cut with a revolving shot drill or shaper, in the wheel they are cut with a slotting machine. By amateurs they are both cut with a narrow chisel and with a file. But even when cut with a machine, there is usually some adjustment, some easing necessary, and much more so when they are cut by hand. Properly the first thing is to be sure that the key itself is true lengthwise, and that the faces are square in relation to each other. Then the key-grooves in the shaft and wheel are dressed down until perfect contact occurs between key and groove throughout their entire length, red or black lead being—as usual—employed as a test for contact. If the key bears hard at one end and it is out of contact at the other, or if only bearing here and there, then, although the fit may seem tight enough on first driving in, the wheel will work loose in course of time.

Short-Circuit Trouble

A few days ago a motorist, preparatory to starting his motor, shoved the switch lever of the coil over onto the battery side. The switch immediately began to smoke, so the switch was swung over to the other side and the motor started on the magneto by spinning it. The car was then taken to the dealer from whom the coil was purchased and a new coil and switch secured. An investigation showed that whenever the switch was shoved over onto the battery side it rubbed against the wire connected with the negative terminal of the battery. This little rub every time the motor was started at last wore away the insulation and caused a short-circuit, which heated up the wire to such an extent that the rest of the insulation was immediately burnt off. The burning of the insulation caused the smoke which was seen to issue from the switch. In wiring up a switch always cut the wires a little long; allow plenty of clearance for moving parts connected therewith; and where wires pass over sharp metal edges, it is advisable to wrap a few layers of tap around those portions.

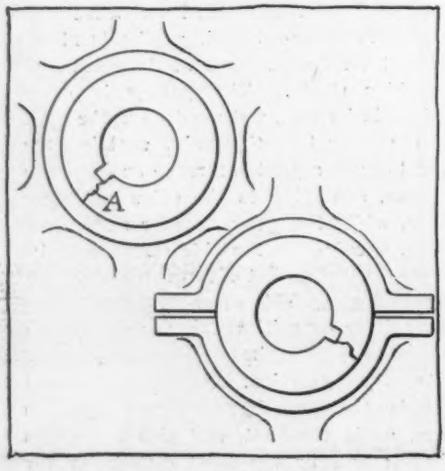


FIG. 1—CRACKED HUB REPAIRS

Repairing Gears

Owing to flaws or internal strains occurring in casting metal wheels, or from an endeavor on the part of an inexperienced mechanic to force a gear onto a shaft which is too large or has too large a key, wheels are sometimes broken at the hub. Two ways of repairing such cases are shown in Fig. 1. If machine tools are available, turn up a ring just a trifle smaller than the outside diameter of the hub and shrink it on. That is, heat it up and slip it on; the shrinkage that takes place as it cools will tend to draw the crack shut and make a tight fit. The other method consists of making clamps which are fastened with bolts as illustrated. Where spokes are broken as in Fig. 2, clamps or reinforcements are made to conform to the shape of the spoke and fastened as shown in the illustration. Of course if the spoke is comparatively light in construction, it would be better to place the bolts on either side instead of letting them pierce the spoke.

Squeaking Glass Fronts

A squeak that is very annoying and sometimes hard to locate is that made by the base of a glass front rubbing on the dash. The cutting of the base of a glass front so that it will conform exactly to the shape of the dash, is often a difficult task. The result is that instead of resting securely all around, it will bear only on the high places, making a tight fit impossible, and cause the squeak. The remedy is to remove the dash and trim off the high places or place a strip of felt between the baseboard and the dash. It is common practice among some fitters of glass fronts to paste a strip of felt to the baseboard in all cases, not only to prevent squeaking but to make a waterproof joint as well.

Run Down Batteries

There is a song which was once quite popular in some of the larger cities of America, entitled "Every little bit added to what you've got, makes just a little bit more." This should be remembered by motorists when they are stalled on the road with a set of run-down batteries. Where batteries are a part of the ignition system, two sources of current are generally used—either two storage batteries, a storage battery and dry cells, or two sets of dry cells. And it is not an uncommon occurrence to find tourists by the roadside with both sources of supply exhausted to such an extent that they are unable to proceed, and waiting for someone to come along with a spare battery. It never occurs to them to couple up the lot and be on their way. There may not have been enough current in either one of the batteries to run the motor, but if both were connected together there would be enough to carry them some distance.

Removing Nuts and Loosening Connections

It is not a bad policy to apply a little kerosene to all nuts and connections on a car that is about to be overhauled, a day or 2 before commencing operations. This will have a tendency to loosen up whatever rust may have accumulated, and facilitate the removal of the parts. When parts so treated are still difficult to remove, heat properly applied to the larger section may do the work. In removing nuts, for instance, a nut may be expanded by carefully heating with a torch, or by heating the jaws of an old wrench to a red heat, applying it to the nut, and when it has cooled down until it has lost its red color, put a strain on the wrench in the right direction and then strike it a sharp blow or two with a hammer. To remove brass water piping, use two wrenches, one to hold the nipple in the cylinder or radiator, and one to loosen the connecting nut. This will prevent twisting the piping. If the connecting nut does not yield readily when two wrenches are used, heat it gently all around and try again, putting an equal strain on both wrenches, in opposite directions.

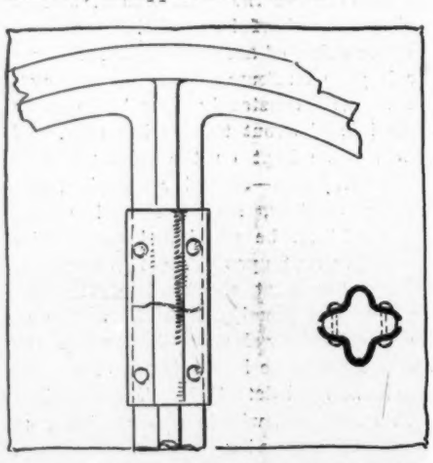


FIG. 2—REPAIRING BROKEN SPOKE

Motor Car Shop Kinks

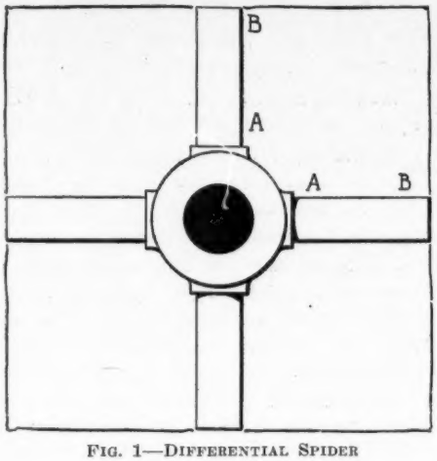


FIG. 1—DIFFERENTIAL SPIDER

Improving a Differential

IN most bevel-gear differentials the pinions are journaled on the four arms of a spider, Fig. 1. This spider is usually case-hardened, but not always, and the pinions are usually bushed with bronze or steel. It is very easy, indeed, for cutting to occur between these bushings and the spider arms, owing sometimes to simple neglect to change the lubricant sufficiently often, sometimes to failure to provide a sufficient supply, and sometimes to the use of lubricant too stiff to work its way in. If the spider arms are of the same diameter for both their bearing surfaces A and the outer ends B where they are clamped in the differential shell, we have when cutting has begun the same conditions that obtains when a straight wristpin begins to cut. In others words, to true up the bearing surface we must theoretically reduce its diameter. This necessitates making a new bushing of smaller diameter to correspond, and this bushing will not pass over the outer end of the arm, which being held in the shell cannot be reduced. The result is that the spider must be thrown away. This contingency may be avoided in the same way that it is avoided in wristpin construction, namely, by making the journal diameter A of the arm a trifle larger than the diameter of the clamped portion. A difference of no more than 1/32-inch between the two will generally save throwing away the spider. If a new spider is to be made to replace one with straight arms, it is easy to make the bushings 1/32-inch larger inside than the old, and make the new spider to correspond, see Fig. 2.

Oil Covers for Spring-Eyebolts

Many cars made a year or two ago, and for that matter not a few built today, are destitute of any reasonable provision for oiling the eye-bolts of the springs and shackles, and if the owner would be saved the affliction of constant squirting and rapid wear in the bolts and shackles he must go the rounds with an oil can every time he takes out the car. To save this futile waste of time many cars are now provided with small grease cups at these points, one filling of which lasts a long time. Where the bolts are not thus treated, but are large enough to receive ⅛-inch pipe tap, it is an excellent plan when overhauling to make new bolts and drill and tap them for grease cups before they are case hardened. The grease passages should be drilled to the center C of the bolt, Fig. 3, and shallow grooves G on the outside of the bolt will help the grease to spread. The bolts should be pinned so they cannot turn in the shackles.

The advantage of grease over oil is that grease fed under pressure to the center of a bearing and working out at both ends forces dirt outward along with it, whereas oil is liable to wash dirt into the bearing unless the oil hole or oil cup is scrupulously clean before oil is introduced. If oil must be used, the thing to do is to use the largest oil cover practicable, with the opening uppermost, and a spring cover to keep out the dirt. One squirt from a can of heavy oil, specially kept for the purpose, will keep that bearing oiled for a week. If the cover is torn from an oil cap in cleaning up the car, replace or repair the cap immediately.

Objection to Grease

To silence the whirring of the gears at the front end of the engine, it is common to pack the case containing them with fairly heavy grease, as much as 20 pounds being sometimes employed for this purpose. The effect is undeniably to quiet the gears, but unfortunately the grease does not always stay where it is put. In some cases it has shown a marked disposition to work through the mainshaft bearing into the crankcase, where it thickens the crankcase oil and produces rapid fouling of the pistons and cylinders. This can in some measure be prevented by using a small quantity of grease, and feeding oil slowly to the case so that it keeps the grease soft and causes it to settle continuously to the bottom of the case instead of being pushed aside by the gears.

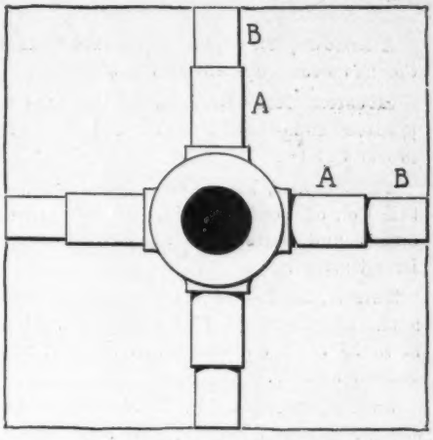


FIG. 2—BUSHINGS ON SPIDER

A Loose Fit Is Necessary

All bearings lubricated by grease require a looser fit than if lubricated with oil. Examples are plain bearings in the wheels, the clutch sleeve running on the rearward extension of the crankshaft, sprocket shaft bearings when these are plain, all the bearings of the steering worm and worm gear, the universal joints of the propeller shaft, and such minor bearings as those at the ends of the steering knuckle arms. The wheel hubs, particularly if care is taken to keep them well supplied with grease, may be a decidedly sloppy fit before they have to be rebushed and the spindles ground true. If such bearings with bronze or cast iron bushings are made too good a fit on the axle they will turn very hard when greased, and are liable to cut from failure of the grease to work in fast enough. The best way to judge whether or not new bushings should be put in is to inquire how much the looseness has increased in the last few months. If it has not sensibly increased, the bushings can probably be left as they are. A number of accidents have been caused by the binding and twisting off of spindles, due to the heating up of a bushing too tightly fitted.

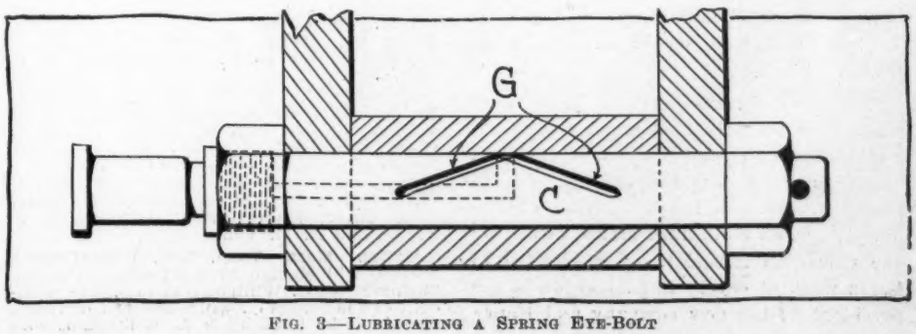


FIG. 3—LUBRICATING A SPRING EYE-BOLT

Brief Business Announcements

Allentown, Pa.—The Allentown Taxicab Co. has been capitalized for $10,000.

Houston, Tex.—G. T. Little has been appointed superintendent of the Southern Motor Car Co.

Philadelphia, Pa.—The Haynes Automobile Co., of Pennsylvania, has just opened offices and salesrooms at 211-213 North Broad street.

Detroit, Mich.—John Gillespie has leased a two-story garage, 75 by 200 feet, which is to be built on Woodward avenue, near Palmer avenue.

Worcester, Mass.—R. L. Morgan & Co., capital stock $300,000; to manufacture motor cars; R. L. Morgan president and H. E. Whitcomb treasurer.

Passaic, N. J.—E. J. Beuret, of this city, has been appointed manager of the sales of the Frontenac cars and gasoline trucks in the local territory for the Abendroth & Root Mfg. Co.

Cleveland, O.—The Babcock Electric Garage and Sales Co. has opened a new establishment on Euclid avenue, opposite Sixty-sixth street. The new garage is to be devoted to electric cars exclusively, not only the Babcock, but also other makes of electric machines.

Kokomo, Ind.—The Apperson Brothers Automobile Co. is rushing work on the erection of the two new buildings which are being added to its plant and expects to have them completed by the middle of August. The company expects to have a new model on the market for the season of 1910.

Chicago, Ill.—A lease has been signed between the Bowes Investment Co. and the Automobile Supply Co. whereby the latter concern is to pay as rental for a three-story building to be erected at 1335 Michigan avenue, an aggregate sum of $44,000. The lease is to run for a term of years.

Pittsburg, Pa.—Application has been made for a charter for a new company to be known as the Puncture Proof Tire Co. The new company is to engage in the manufacture and sale of materials for filling rubber tires and other pneumatic devices, and also motor accessories of various kinds.

Worcester, Mass.—The R. L. Morgan Co., which recently filed articles of incorporation with a capital stock of $300,000, plans to commence the manufacture of motor trucks. It has leased the three-story plant on Cambridge street, owned by the Crompton Associates, and planned to begin work at once. R. L. Morgan is the president of the new company and Henry H. Whitcomb, treasurer and general manager. The capacity of the plant is 500 cars yearly.

New York—The C. A. Duer Co., selling agent at 2182 Broadway, has filed a petition in bankruptcy; liabilities $94,702.

San Francisco, Cal.—The Maxwell-Briscoe company is preparing to remove from Golden Gate avenue to its new building at Fulton street and Van Ness avenue.

New York City—An important change in the local field has been the removal of Cimiotti Brothers, local representatives for the Pullman car, to Broadway and Sixty-first street.

Indianapolis, Ind.—The Western Motor Co., of Logansport, has filed a notice of the increase of its capital stock from $250,000 to $400,000. F. B. Wilkinson is the president of the company.

New York—The Twentieth Century Automobile Co. has leased the store and basement at 1615-1617 Broadway and 209 West 49th street. Another lease is that of the store at 1623 Broadway to the Isotta Import Co.

Castleton, N. Y.—A new company is shortly to start in business here, with H. H. Ingalls as president and A. Cheeny as secretary and treasurer. The company will manufacture the Belmont car, and is to be located on the grounds of the A. C. Cheeny factory.

Pittsburg, Pa.—Robert P. McCurdy, who has been connected with the Banker Brothers company as general manager for the past 6 years, has severed his connection with this concern. In the future Mr. McCurdy will act as agent for the Pierce-Arrow car in western Pennsylvania, eastern Ohio and West Virginia. He is to make his headquarters in this city.

Newark, N. J.—F. L. C. Martin has been appointed state agent for the Hupmobile.

Princeton, N. J.—James Mulrey, who was formerly connected with the Walter factory, has been appointed night manager of the Princeton garage.

Boston, Mass.—The Whitten-Gilmour Co. has been appointed agent in eastern Massachusetts for the Hudson, and will continue to represent the Thomas and Chalmers-Detroit.

Lockport, N. Y.—Plans have been prepared for the erection of a new building for the Covert Motor Vehicle Co., manufacturer of tops and bodies. The new building is to cost about $20,000.

New York City—George B. Adams, who has been connected with the local Cadillac agency, has resigned from that concern, and in the future will be a member of the selling staff of the Rainier Motor Car Co.

Jamestown, N. Y.—The Salisbury Wheel and Mfg. Co. has leased the factory of the Straight Mfg. Co. and will utilize it as an auxiliary plant. The concern has been working night and day, but is unable to catch up with the orders on hand, but now the capacity will be more than doubled.

Muskegon, Mich.—The Continental Motor Co. is erecting a third story to its main factory, having been cramped for room for several months, and consequently being unable to keep pace with its orders. The company is now employing 550 men, but by July 1 is to increase its employes to 700.

Springfield, Ill.—Articles of incorporation have been filed by the Arrow Taxicab Co., of Chicago, which has a capital stock of $5,000, and is to engage in the business of manufacturing and operating motor cars. William A. Jennings, of 171 Washington street, Chicago, is the only incorporator named.

Jamestown, N. Y.—The Jamestown Garage Co. held its annual meeting during the past week, and elected the following officers: President, James C. Peterson; vice-president, A. H. Reynolds; secretary, W. C. Price; treasurer, M. B. Kent. Mr. Kent is to be in charge of the company's business in the future.

Waukesha, Wis.—The Waukesha Motor Co. reports the increase of its capital stock from $25,000 to $100,000, all local capital. The concern, which is engaged in the manufacture of gasoline motors for motor cars, is planning to erect a new plant of one story, 100 by 100 feet, and will give employment to 150 men within a year.

RECENT INCORPORATIONS

Trenton, N. J.—Mercer Automobile Co., capital stock $500,000. Among those interested in the new concern are Ferdinand W. Roebling, Sr., Anthony B. Kuser, Charles G. Roebling and John L. Kuser. The company will take over the plant of the Walter company and will engage in the manufacture of motor cars, etc.

Wilmington, Del.—Motor Commercial Delivery Co., capital stock $100,000. Incorporators, M. L. Rogers, S. E. Robertson and H. W. Davis.

Buffalo, N. Y.—Thomas Taxicab and Transfer Co., capital stock $100,000, to engage in the operation of taxicabs and motor cars. Incorporators, E. L. Thomas, J. M. Edsall and M. I. Brock, all of Buffalo.

New York—Custead Motor Vehicle Co., capital stock $100,000, to manufacture motor cars. Incorporators, W. D. Custead, C. F. Didion and A. M. Von.

Boston, Mass.—Taxa, Inc., capital stock $50,000, will engage in a general motor car business. C. G. Whitcomb is to be the president of the company, while the post of treasurer is to be filled by J. A. Whitcomb, both of this city.